POOSF 2.7.1-5

LWG
LOWER WILLAMETTE GROUP

PORTLAND HARBOR RI/FS

ROUND 3A
SEDIMENT TRAP SAMPLING
QUARTER 4
FIELD REPORT

DO NOT QUOTE OR CITE
This document is currently under review by US EPA and its federal, state and tribal partners and is subject to change in whole or in part.

RECOMMENDED FOR INCLUSION IN ADMINISTRATIVE RECORD

January 2008

Prepared for:
The Lower Willamette Group

Prepared by:
Anchor Environmental, L.L.C.

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LIST OF ACRONYMS

DGPS	differential global positioning system
EPA	U.S. Environmental Protection Agency
FSP	Field Sampling Plan
LWG	Lower Willamette Group
NAD	North American Datum
PCB	polychlorinated biphenyl
QAPP	Quality Assurance Project Plan
RI/FS	Remedial Investigation/Feasibility Study

1.0 INTRODUCTION

The Lower Willamette Group (LWG) has proceeded with a third round of sampling and analysis to supplement the results of previous investigations that have been conducted for the remedial investigation and feasibility study (RI/FS) of the Portland Harbor Superfund Site (Site). The Round 3A sampling program components include surface water sampling, surface sediment sampling, tissue sampling (i.e., sturgeon), and suspended sediment sampling. This report summarizes the fourth and final sampling event (Quarter 4) for the suspended sediment program component.

The suspended sediment component of the program involves using sediment traps to collect the sediment settling from the surface water column. The traps were deployed between October 30, 2006 and November 2, 2006. They were recovered quarterly, and the accumulated sediment was collected, when volumes were adequate, for analysis. The Quarter 4 sampling was the final event, and the traps were sampled and retrieved on November 13 and 14, 2007. Information regarding the design of the sediment traps, the specific objectives of the sediment trap program, the sampling design and rationale, and the program's context in the overall project approach can be found in the Field Sampling Plan (FSP; Anchor 2006).

2.0 ROUND 3A SEDIMENT TRAP QUARTER 3 SAMPLING FIELD ACTIVITIES

The LWG and U.S. Environmental Protection Agency (EPA) established 16 sediment trap locations in the Lower Willamette River for Round 3A suspended sediment collection. The rationale for the selection of sample locations is described in detail in the FSP (Anchor 2006). A summary of the schedule that was implemented for the program is provided in Table 2-1.

2.1 STATION POSITIONING AND VERTICAL CONTROL

The stations were located using a differential global positioning system (DGPS), which consists of a GPS receiver on the sampling platform and a differential receiver located at a horizontal control point. This system provided the capability to accurately determine and record the positions of all sampling locations to within ± 2 meters. Sediment trap locations are presented in Figure 2-1a – e.

The water depth at each sampling location was measured using the diver's depth gauge during sampling operations. Vertical measurements were recorded to the nearest foot (Table 2-2).

2.2 RETRIEVAL AND REDEPLOYMENT PROCEDURE

The sediment traps were retrieved and redeployed by commercial divers. The 25-foot sampling vessel and divers were contracted through Research Support Services, L.L.C.

Trap locations were found using the coordinates recorded when the traps were deployed. Upon arriving at the target coordinates, a lead weight with line and surface buoy was deployed, and the vessel was then secured near the buoy's position using a 2-point or 3-point anchor arrangement. The diver descended to the trap location by following the buoy line. At all locations, the diver was able to find the trap immediately when reaching the bottom.

After finding the sediment trap, the diver carefully removed the sampler from the supporting rod and attached it to the tending line so that it could be hauled up. The on-board attending diver gently hauled the filled sediment trap to the surface, taking care to maintain the line and sampler as vertical as possible. Care was taken not to jostle or disturb the sediment in the recovered sediment trap until preliminary activities prior to collecting the sediment were complete. The sediment trap was then secured on board.

Where possible, the diver removed the supporting rod from the sediment and attached it to the tending line so that it could be hauled up. At stations where mushroom anchors had been deployed, the diver retrieved those that could be located.

2.3 SAMPLING PROCEDURES AND DOCUMENTATION

The procedures for sampling the sediment in the traps are described in detail in the FSP (Anchor 2006). Prior to removing the sediment from the tubes, the height of sediment in each tube was recorded (see Table 2-2), and the sediment color, layering, and type were entered into core logs (see Appendix A for scanned copies of the field logbook and all field forms). Photos of the filled sampler were also taken. The sediment from both tubes was homogenized in one decontaminated stainless steel bowl. The homogenized sediment was spooned into labeled jars and stored in a cooler with ice.

After sediment was collected from the tubes, the sediment trap was cleaned in preparation for storage at the Integral laboratory.

The volume of sediment collected from three locations (ST003, ST006, and ST009) was insufficient to fill the full set of sample jars. The Integral laboratory coordinator instructed the analytical laboratory, Columbia Analytical Systems, to verify the sample weights and total solids content. The laboratory found that there was insufficient volume to perform all tests; therefore, an analyte prioritization list for the three stations was generated. This new prioritization scheme was approved by the EPA. The analyses are currently in progress according to the approved analysis scheme.

2.4 FIELD DOCUMENTATION

Field activities and observations were noted in a field logbook during fieldwork. Information entered included personnel, date, time, station designation, sampler, general observations, and any health and safety issues. Requirements for logbook entries followed the guidelines specified in the Round 2 Quality Assurance Project Plan (QAPP; Integral and Windward Environmental 2004).

All information pertaining to each sample was recorded on individual field forms. This information included time of sampling, water depth, height of sediment in the tubes, sediment description, sediment volume, and core logs. The field forms are provided in Appendix A.

3.0 REFERENCES

Anchor. 2006. Portland Harbor Remedial Investigation/Feasibility Study (RI/FS). Round 3A Field Sampling Plan - Sediment Traps. Prepared for the Lower Willamette Group, Portland, OR. Anchor Environmental, L.L.C., Seattle, WA. August.

Integral Consulting and Windward Environmental. 2004. Portland Harbor RI/FS Round 2 Quality Assurance Project Plan. Prepared for the Lower Willamette Group, Portland, OR. Integral Consulting, Inc., Mercer Island, WA.

Tables

Table 2-1. Sediment Trap Deployment, Sampling, and Retrieval Schedule

Event	Date
Deployment of sediment traps	October 30 to November 2, 2006
Quarter 1 sampling	January 30 to February 2, 2007
Quarter 2 sampling	April 30 to May 2, 2007
Quarter 3 sampling	August 8, 16, and 17, 2007
Quarter 4 sampling and retrieval of sediment traps	November 13 and 14, 2007

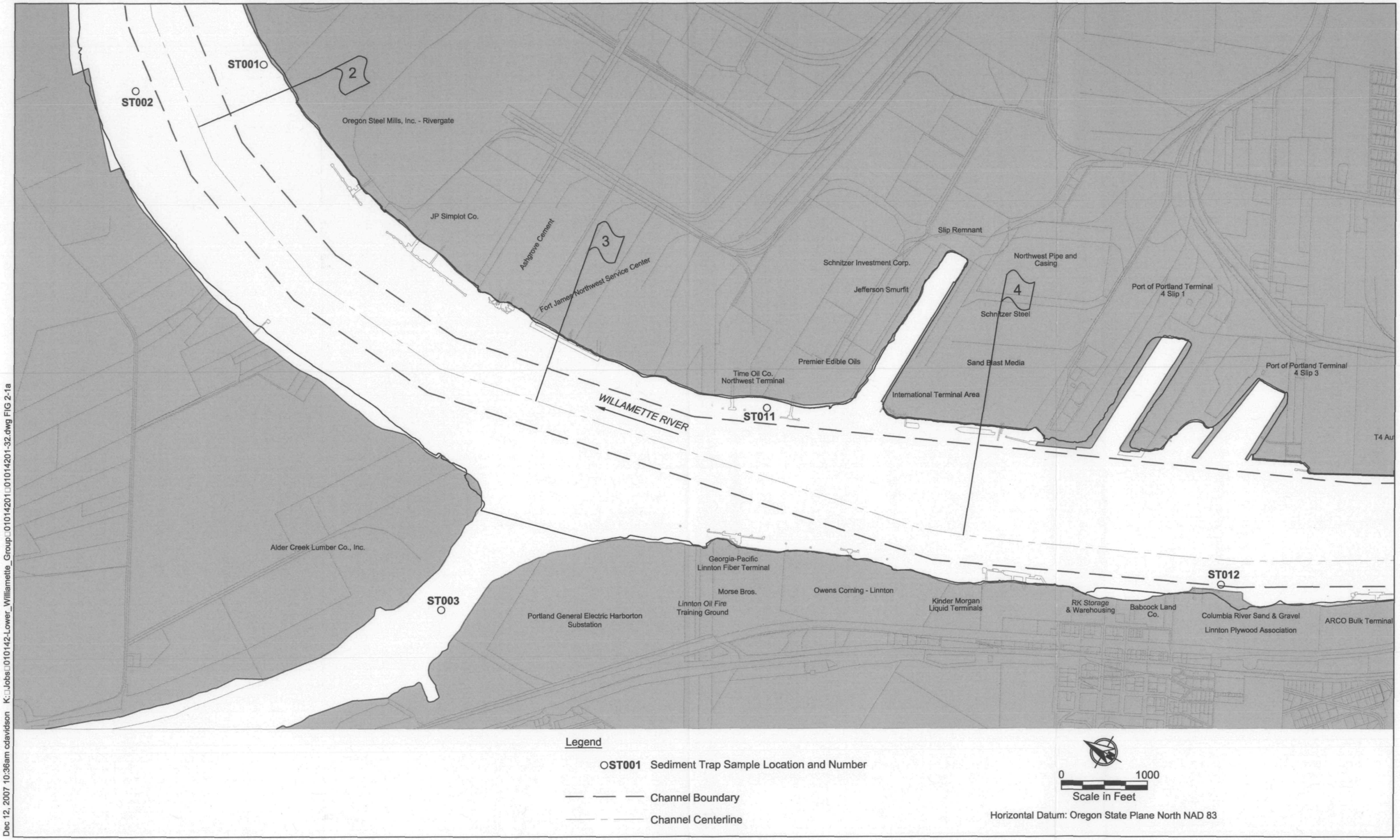
Table 2-2. Sample Information and Station Coordinates.

Location	Date Sampled	Water Depth (ft)	Average Sediment Height (cm)	Total Volume of Sediment (L)	Coordinates			
					Northing	Easting	Latitude (°N)	Longitude (°W)
ST001	11/14/2007	19	6.1	2.13	725222	7617870	45 37.9936	122 47.0541
ST002	11/14/2007	26	6.0	2.09	726356	7616862	45 38.1753	122 47.2980
ST003	11/14/2007	31	1.4	0.49[1]	720286	7613456	45 37.1610	122 48.0560
ST004	11/13/2007	30	5.8	2.06	707291	7623479	45 35.0699	122 45.6213
ST005	11/13/2007	28	7.9	2.78	706509	7622786	45 34.9382	122 45.7785
ST006	11/13/2007	20	2.0	0.72[1]	699027	7636489	45 33.7698	122 42.5205
ST007	11/13/2007	27	7.9	2.78	689178	7644322	45 32.1845	122 40.6242
ST008	11/13/2007	28	12.5	4.40	687861	7644207	45 31.9675	122 40.6426
ST009	11/13/2007	19	1.7	0.58[1]	666725	7647077	45 28.5033	122 39.8385
ST010	11/13/2007	27	6.0	2.11	667278	7646323	45 28.5909	122 40.0183
ST011	11/14/2007	24	5.9	2.06	718185	7617360	45 36.8335	122 47.1272
ST012	11/14/2007	29	6.2	2.17	712615	7618224	45 35.9215	122 46.8878
ST013	11/13/2007	27	3.3	1.15	705423	7626969	45 34.7788	122 44.7915
ST014	11/13/2007	23	20.5	7.26	701232	7628746	45 34.0970	122 44.3715
ST015	11/13/2007	34	9.2	3.25	694607	7637564	45 33.0476	122 42.2405
ST016	11/13/2007	39	4.2	1.50	694895	7639305	45 33.1028	122 41.8347

Oregon State Plane North - feet; NAD (North American Datum) 83

[1] Insufficient material for all analyses.

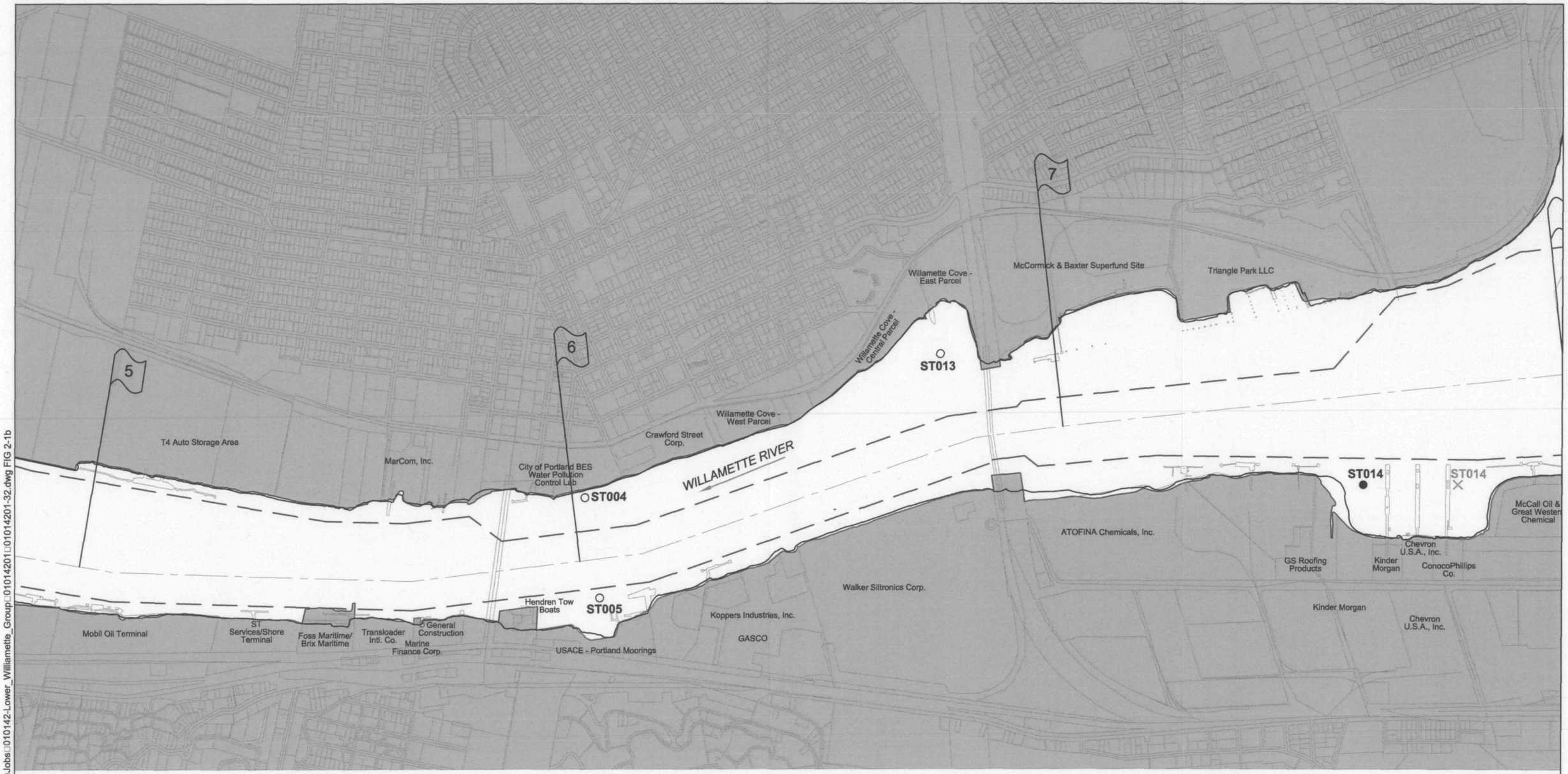
Figures



Dec 12, 2007 10:36am cdavidson K:\Jobs\010142-Lower_Willamette_Group\01014201\01014201-32.dwg FIG 2-1a

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2-1a
Portland Harbor RI/FS
Round 3a Sediment Trap Quarter 4 Sampling Field Report - November 2007
Sediment Trap Locations



Legend

- **ST005** ○ Sediment Trap Sample Location and Number
- ST014 × Original Target - 30 Oct 2006
- **ST014** ● Relocated Location for Re-Deployment - 02 May 2007
- Channel Boundary
- Channel Centerline

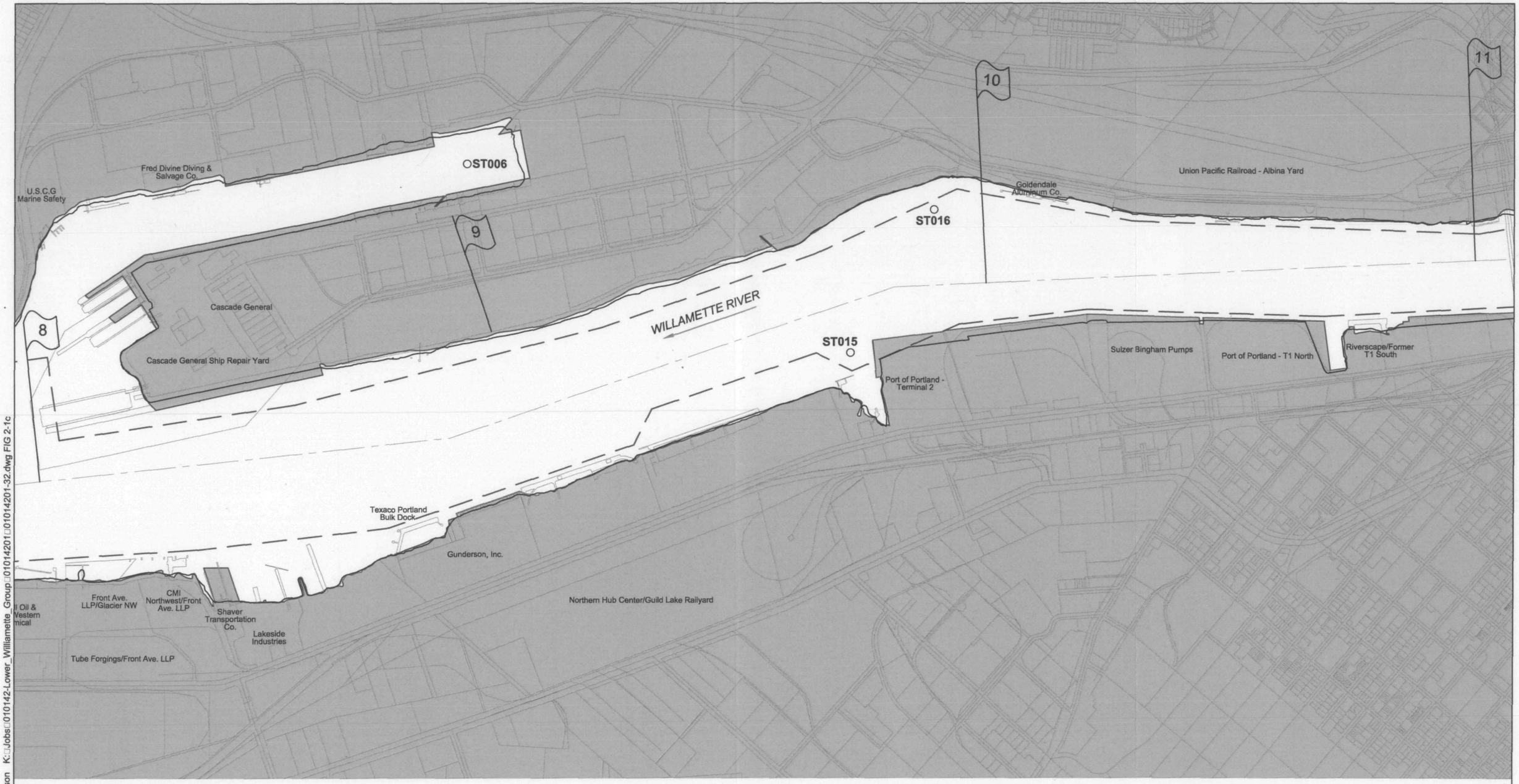
0 1000
Scale in Feet

Horizontal Datum: Oregon State Plane North NAD 83

Dec 12, 2007 10:38am cdavidson K:\Jobs\010142-Lower_Williamette_Group\010142011\010142011-32.dwg FIG 2-1b

ANCHOR ENVIRONMENTAL, L.L.C.

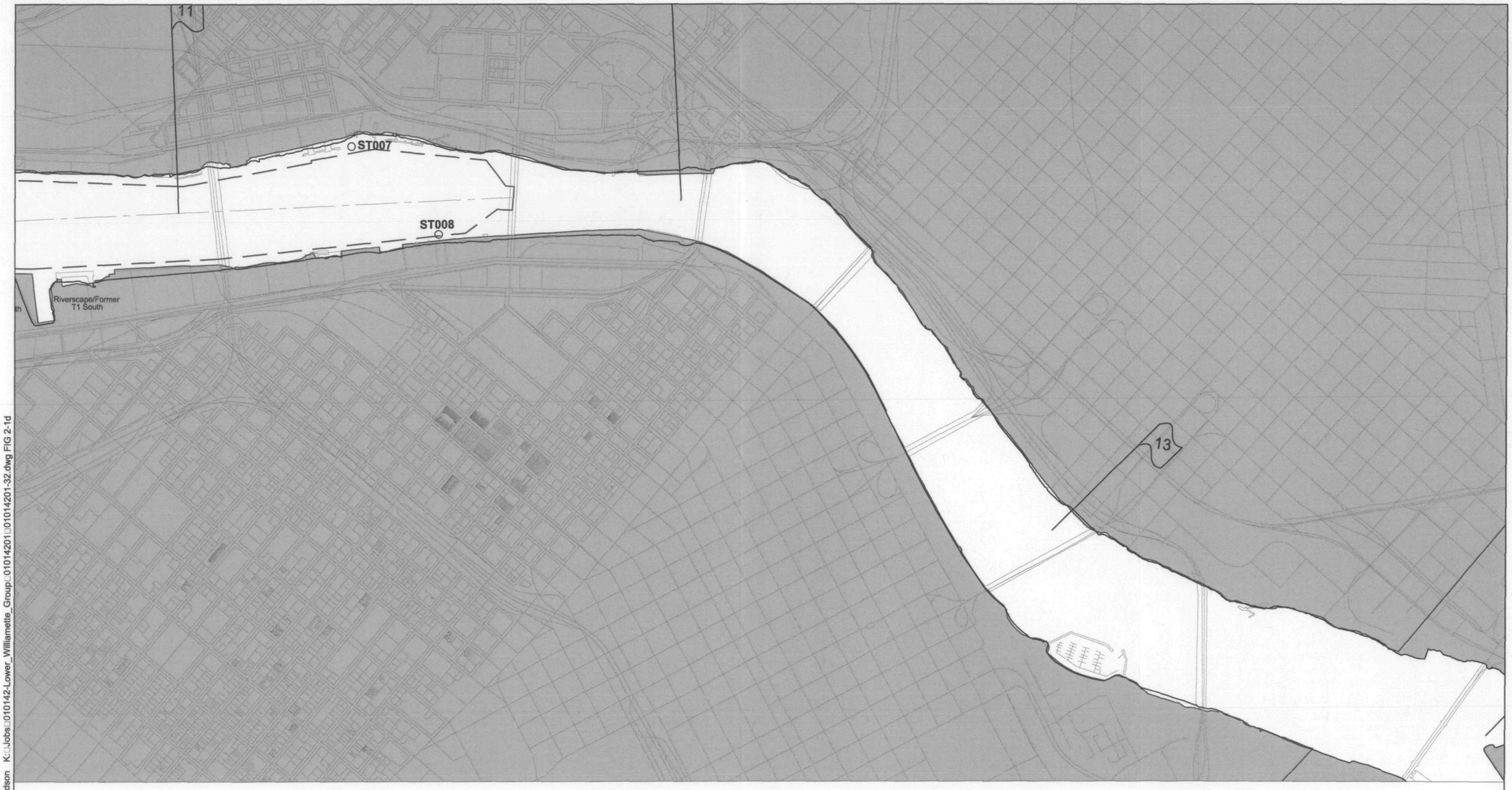
Figure 2-1b
Portland Harbor RI/FS
Round 3a Sediment Trap Quarter 4 Sampling Field Report - November 2007
Sediment Trap Locations



Dec 12, 2007 10:39am cdavidson K:\Jobs\010142\01014201-32.dwg FIG 2-1c

ANCHOR ENVIRONMENTAL, L.L.C.

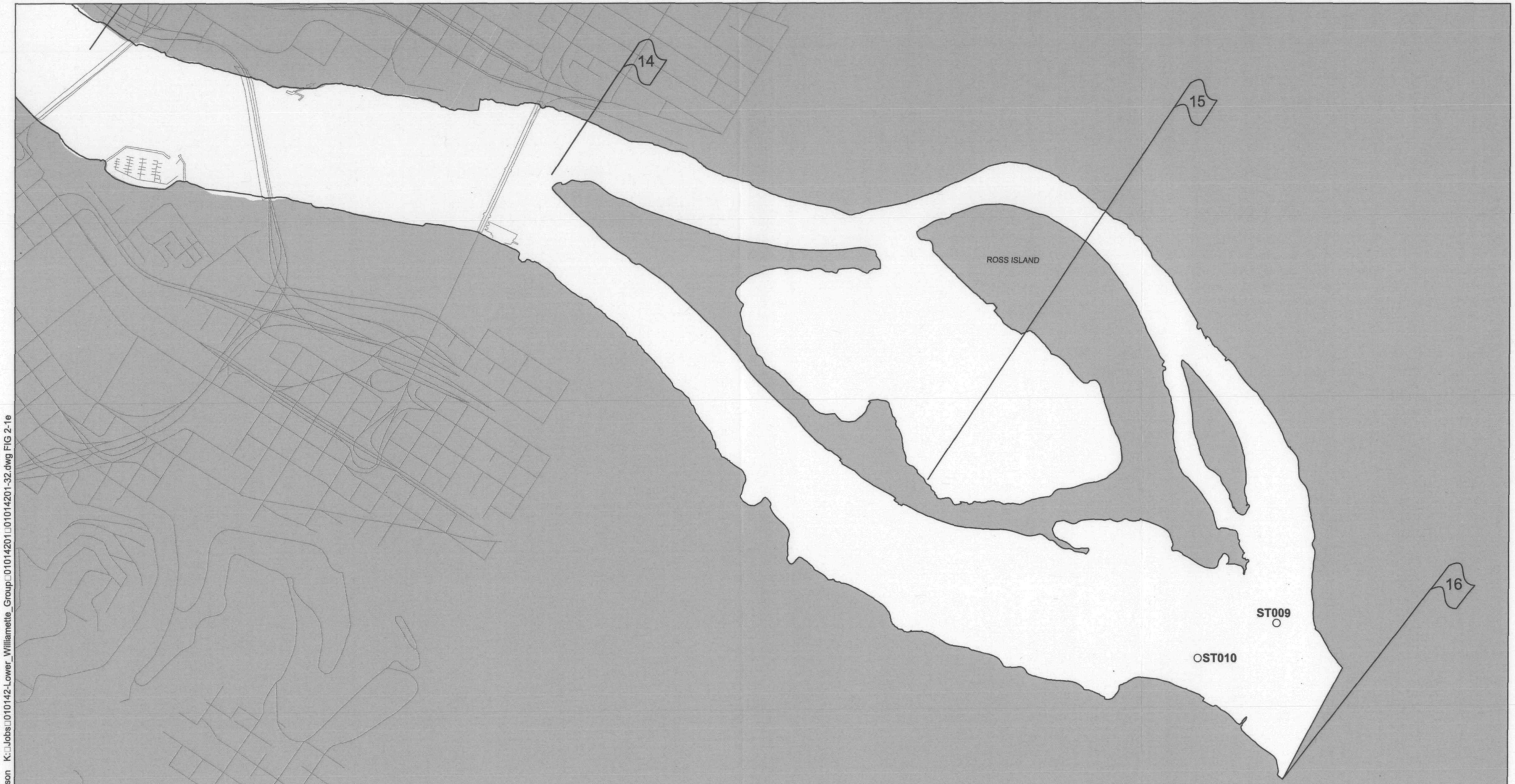
Figure 2-1c
Portland Harbor RI/FS
Round 3a Sediment Trap Quarter 4 Sampling Field Report - November 2007
Sediment Trap Locations



Dec 12, 2007 10:39am cdavidson K:\Jobs\010142-Lower_Willamette_Group\01014201\01014201-32.dwg FIG 2-1d

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2-1d
Portland Harbor RI/FS
Round 3a Sediment Trap Quarter 4 Sampling Field Report - November 2007
Sediment Trap Locations



Legend

ST009○ Sediment Trap Sample Location and Number

Channel Boundary

Channel Centerline

0 1000

Scale in Feet

Horizontal Datum: Oregon State Plane North NAD 83

Dec 12, 2007 10:39am cdavidson K:\Jobs\010142-Lower_Williamette_Group\01014201\01014201-32.dwg FIG 2-1e

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2-1e
Portland Harbor RI/FS
Round 3a Sediment Trap Quarter 4 Sampling Field Report - November 2007
Sediment Trap Locations

Appendix A

Field Documentation

ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 13 Nov-07 **Time:** 0900 **Deployment Duration (days):** 88

Weather: clear, calm, 42° F

Station ID: LW3-ST009 **Sample ID:** LW3-ST4009

Project Name: LWG Sediment Traps **Project Number:** 010142-01

Coordinates (NAD 83):
Lat/Northing: 666725 Long/Easting: 7647077
(Oregon State Plane Feet)

(A) Measured Water Depth (ft): 19.8

(B) Predicted Tide Height (ft) (MLLW): 1.8

(C) Predicted Mudline Elevation (ft) (MLLW): -17.2

(-A+B = C include sign of tide height as reported)

	Tube # 11	Tube # 36
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements) 1	1.7	1.5
2	1.3	2.2
3	0.7	1.8
4	1.5	2.0
5	1.5	1.8
6	1.7	1.8
7	1.3	1.5
8	1.4	2.2
Average Sediment Height (cm):	1.4	1.9
Volume (L) = 0.177 x H:	0.25	0.33

Tape height relative to mudline: —

Notes:

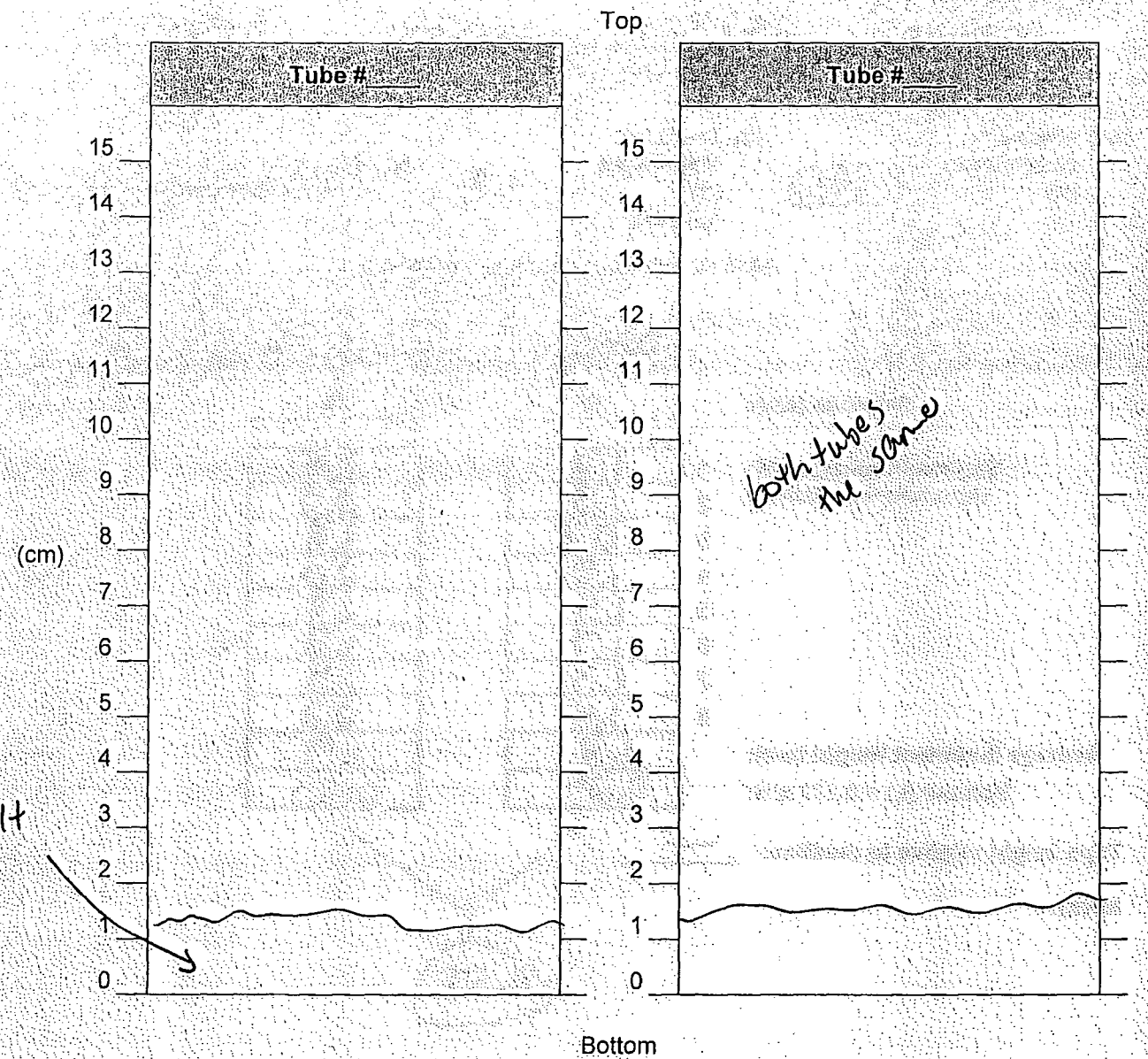
0.58

Recorded by: DH, LV, JS

Date: 13 NOV 2007

Station ID: ST099

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Trap Collection Form

Date: 13-Nov 07 Time: 0945 Deployment Duration (days): 88

Weather: Clear, calm

Station ID: ST010 Sample ID: LW3-ST4 010

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 667278 Long/Easting: 7646323
(Oregon State Plane Feet)

(A) Measured Water Depth (ft) 27

(B) Predicted Tide Height (ft) (MLLW) 1.8

(C) Predicted Mudline Elevation (ft) (MLLW) -25.2

(-A+B = C include sign of tide height as reported)

		Tube # 32	Tube # 33
Diameter (cm):		15	15
Sediment Height (cm): (8 perimeter measurements)	1	5.7	5.5
	2	5.7	5.5
	3	6.0	5.5
	4	6.0	6.0
	5	6.9	5.9
	6	7.1	6.2
	7	6.3	5.9
	8	5.5	5.5
Average Sediment Height (cm):		6.2	5.8
Volume (L) = 0.177 x H:		1.09	1.02

2.11

Tape height relative to mudline: ____

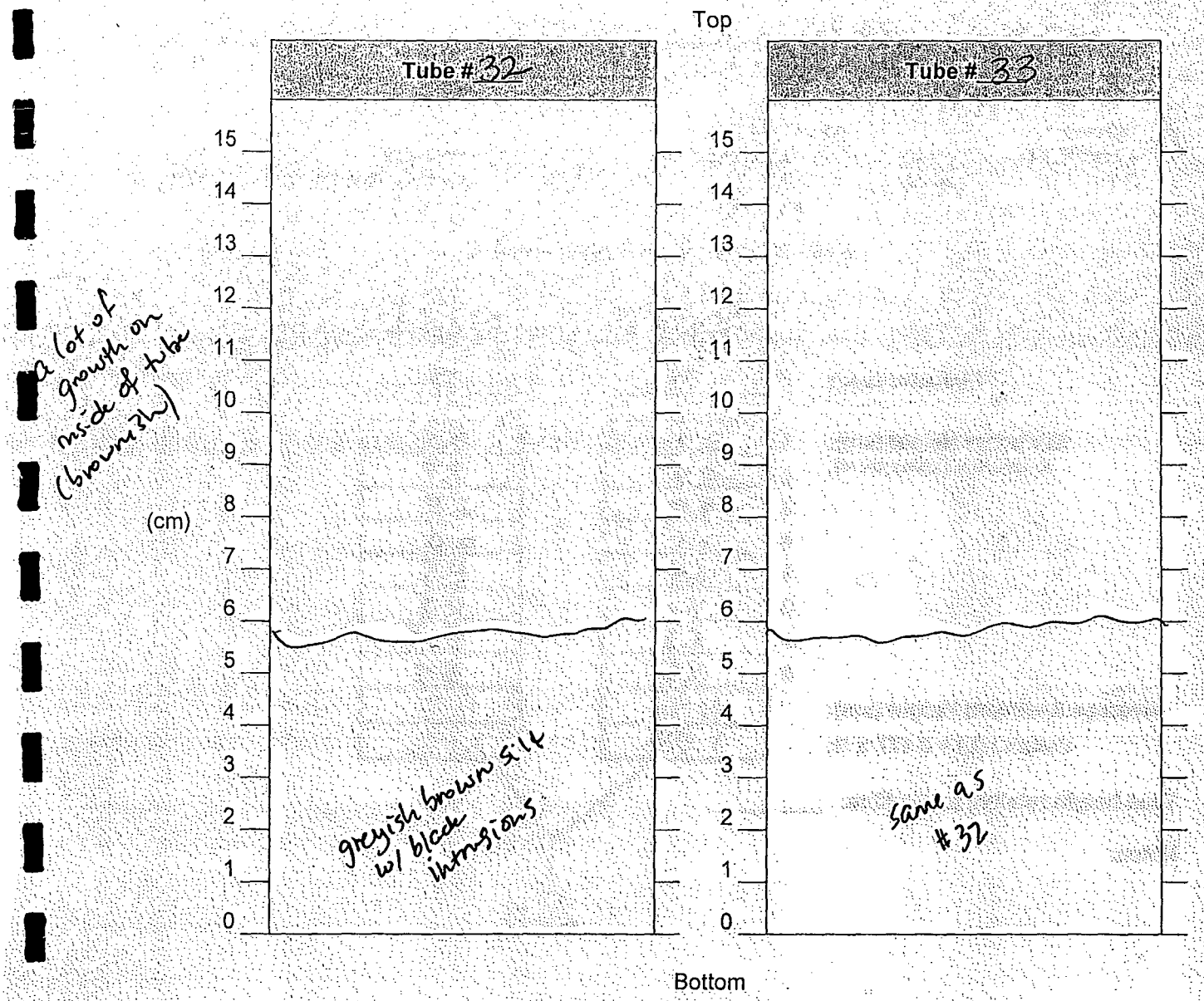
Notes:

Recorded by: DH, LV, JS

Date: 13 Nov 07

Station ID: ST010

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 13 Nov 2007 Time: 1045 Deployment Duration (days): 88

Weather: clear calm

Station ID: ST008 Sample ID: LW3-ST4 008

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 687861 Long/Easting: 7644207
(Oregon State Plane Feet)

(A) Measured Water Depth (ft): 28

(B) Predicted Tide Height (ft) (MLLW): 1.7

(C) Predicted Mudline Elevation (ft) (MLLW): -26.3

(-A+B = C include sign of tide height as reported)

		Tube #13	Tube #12
Diameter (cm):		15	15
Sediment Height (cm): (8 perimeter measurements)	1	13.5	11.5
	2	13.3	11.2
	3	13.5	11.1
	4	13.1	11.8
	5	12.7	12.0
	6	12.8	11.8
	7	13.5	11.7
	8	13.7	11.6
Average Sediment Height (cm):		13.3	11.6
Volume (L) = 0.177 x H:		2.35	2.05

4.4

Tape height relative to mudline: _____

Notes:
- grayish-green silt
- some thin, dark banding

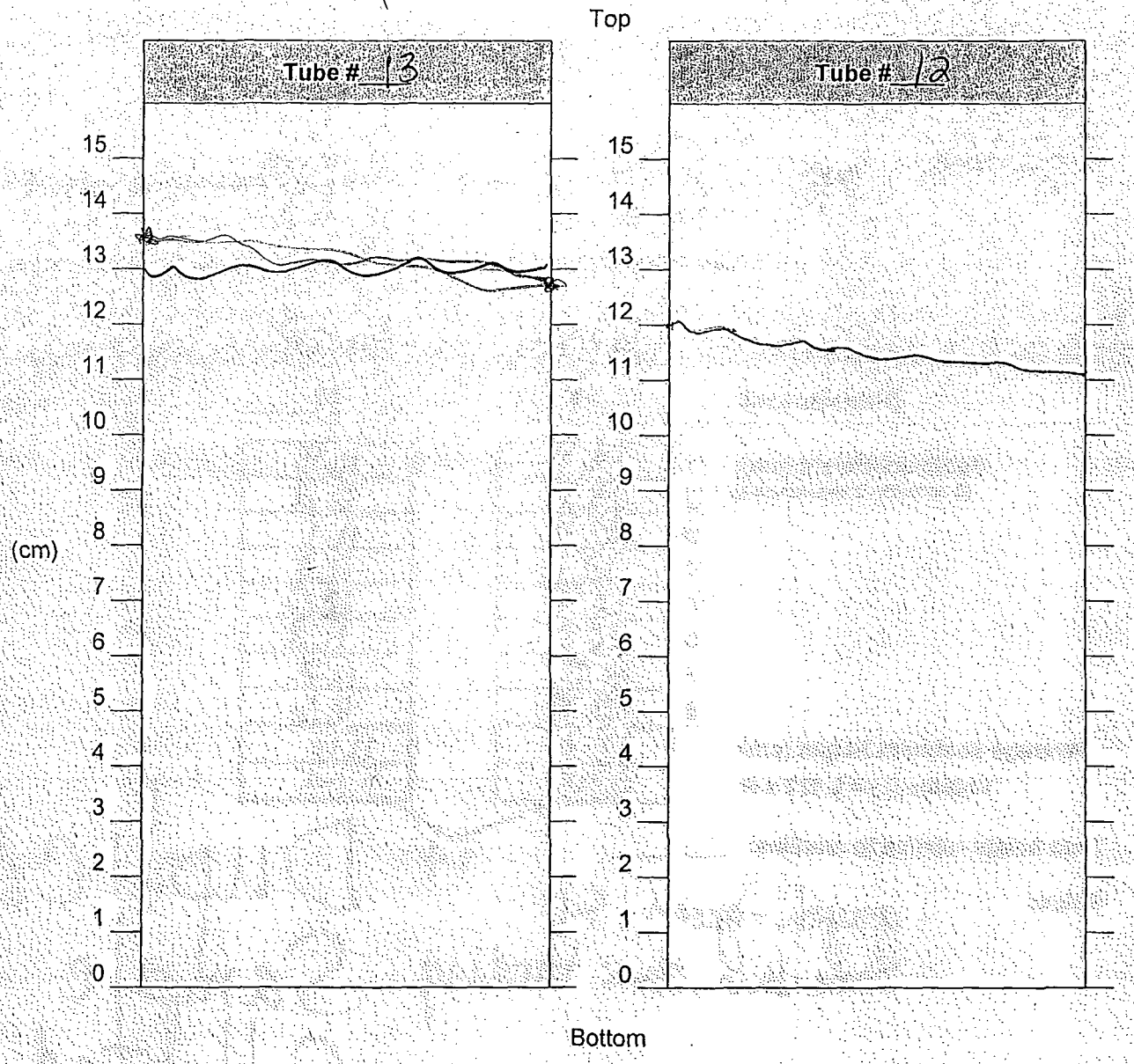
Duplicate Sample Collected at ST008

Recorded by: DM, LV, JS.

Date: 13 NOV 2007

Station ID: STOP 8

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 11/13/07 Time: 11:15 Deployment Duration (days): 88

Weather: Clear, calm.

Station ID: ST007 Sample ID: LW3-ST4 007

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 689178 Long/Easting: 7644322
(Oregon State Plane Feet)

27 DFK 11/13/07

(A) Measured Water Depth (ft): ~~28~~

(B) Predicted Tide Height (ft) (MLLW): 1.7

(C) Predicted Mudline Elevation (ft) (MLLW): -25.3

(-A+B = C include sign of tide height as reported)

		Tube # 9	Tube # 10	
Diameter (cm):		15	15	
Sediment Height (cm): (8 perimeter measurements)	1	8.2	7.1	7.5
	2	8.1	~~8.6~~ 7.8	7.7
	3	8.0	7.7	7.8
	4	7.6	7.9	7.8
	5	7.2	7.7	8.0
	6	8.0	8.0	8.0
	7	8.0	8.0	7.9
	8	7.8		8.0
Average Sediment Height (cm):		7.9	7.8	7.8
Volume (L) = 0.177 x H:		1.39	1.39	1.39

~~8~~ Switched tubes inadvertently

Use this

Tape height relative to mudline: _____

Notes:
- grayish-green silty/sand
- Slight banding

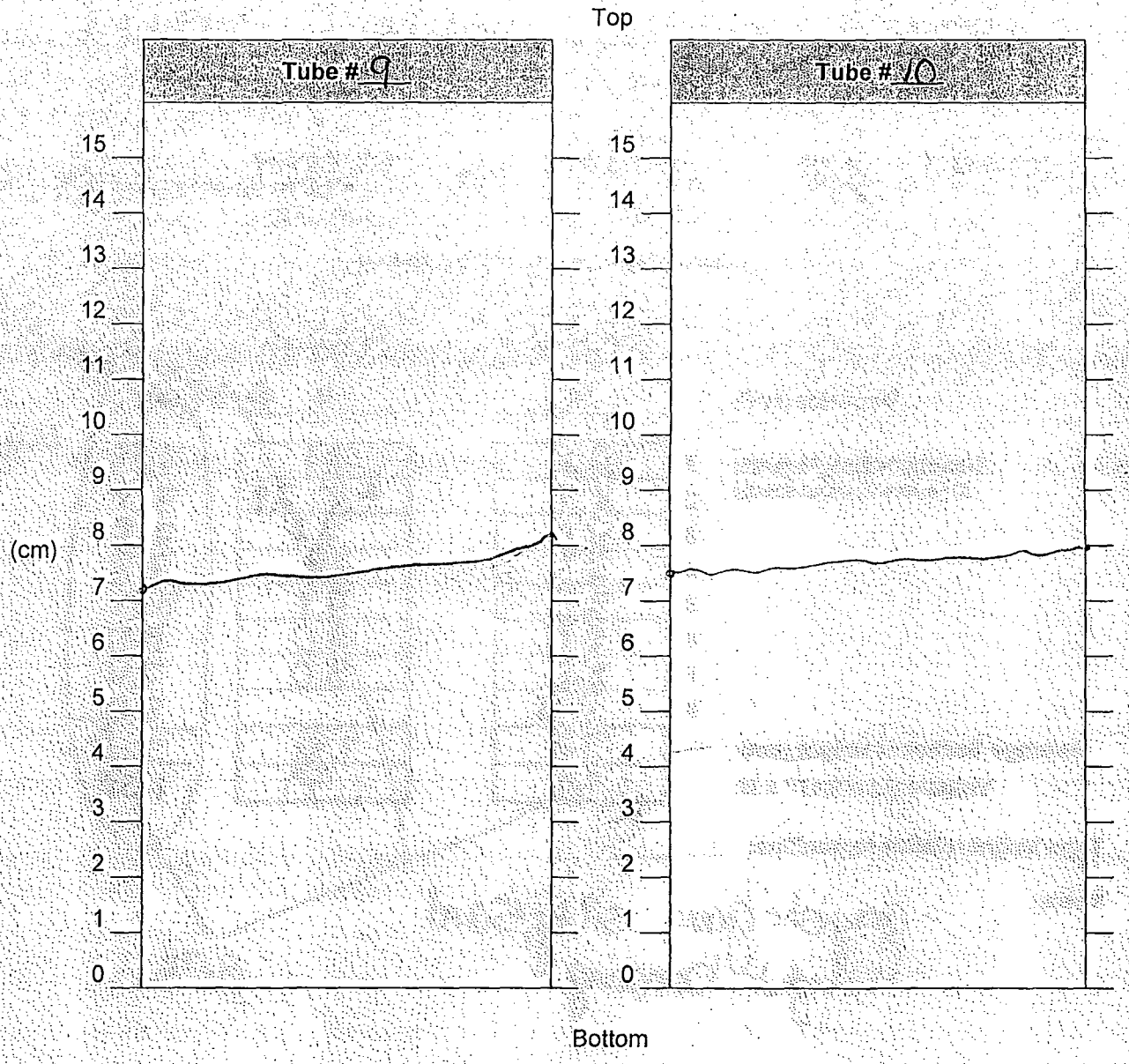
2.78

Recorded by: DFK, LV, JS

Date: 13 NOV 07

Station ID: ST001

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 11/13/07 Time: 12:15 Deployment Duration (days): 88

Weather: clear, calm

Station ID: LW3-ST016 Sample ID: LW3-ST4 016 no archive

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83): Lat/Northing: 694895 Long/Easting: 7639305 (Oregon State Plane Feet)

(A) Measured Water Depth (ft) 39 (B) Predicted Tide Height (ft) (MLLW) 1.5 (C) Predicted Mudline Elevation (ft) (MLLW) -37.5

(-A+B = C include sign of tide height as reported)

27

	Tube # 14	Tube # 15
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements) 1	3.8	3.8
2	4.0	3.7
3	3.9	3.8
4	4.7	3.8
5	5.0	3.6
6	4.9	4.1
7	4.8	4.5
8	4.4	4.7
Average Sediment Height (cm):	4.4	4
Volume (L) = 0.177 x H:	0.79	0.71

Tape height relative to mudline: 1.5

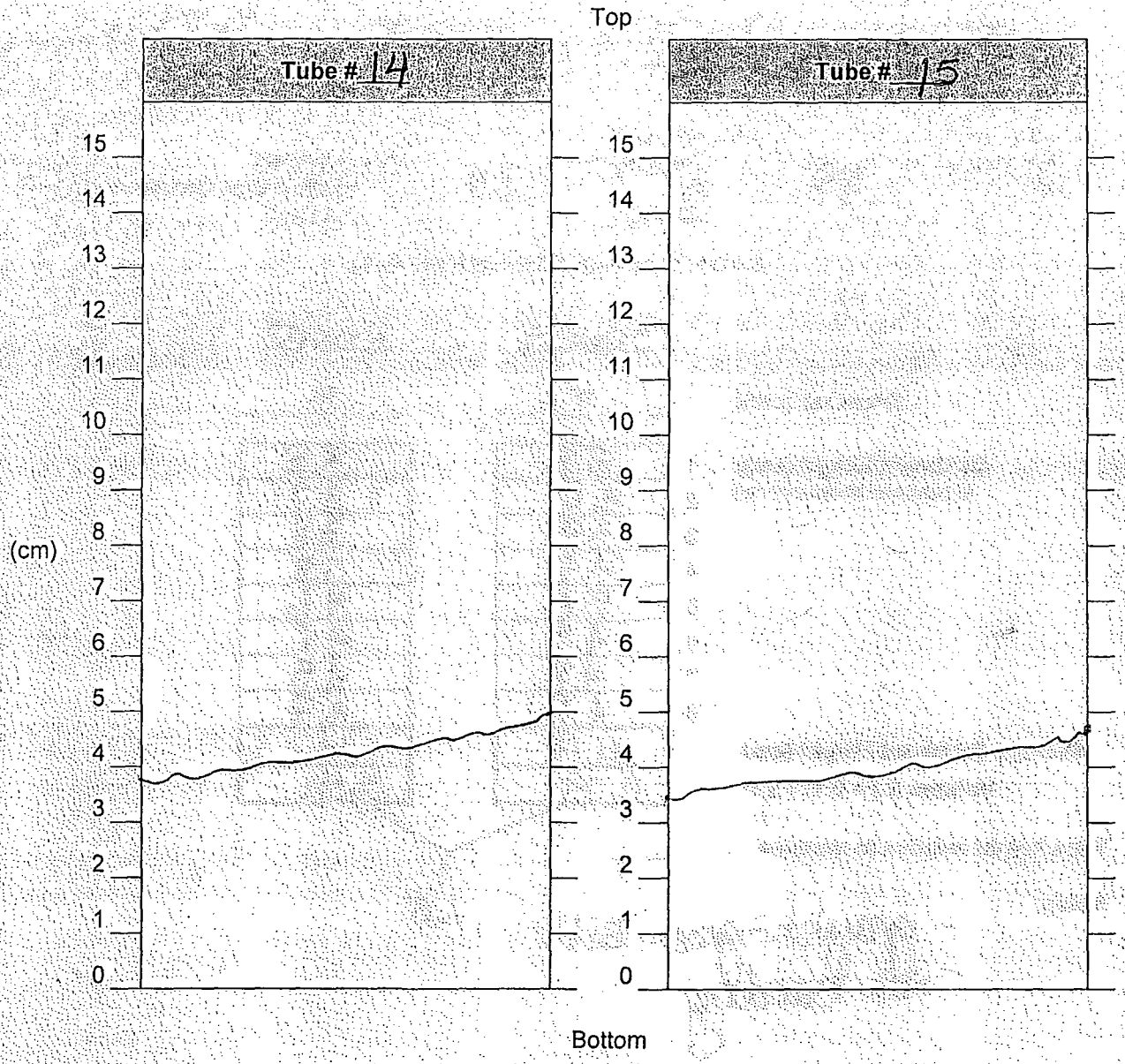
Notes:
- grayish-green silt
- no banding

Recorded by: DH, LV, JS

Date: 13 NOV 07

Station ID: ST016

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Trap Collection Form

Date: 11/13/07 Time: 1230 Deployment Duration (days): 88

Weather: clear, calm.

Station ID: LW3-ST015 Sample ID: LW3-ST4 015

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 694607 Long/Easting: 7637564
(Oregon State Plane Feet)

(A) Measured Water Depth (ft): ~~39~~ 34 DH 11/13/07
(B) Predicted Tide Height (ft) (MLLW): 1.4
(C) Predicted Mudline Elevation (ft) (MLLW): -32.6

(-A+B = C include sign of tide height as reported)

	Tube # 3	Tube # 4
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements) 1	9.0	9.0
2	9.0	9.4
3	9.5	8.0
4	9.7	8.9
5	9.6	9.0
6	9.7	9.2
7	9.5	8.8
8	9.3	9.2
Average Sediment Height (cm):	9.4	8.9
Volume (L) = 0.177 x H:	1.67	1.58

Tape height relative to mudline: ______

3.25 (total, both tubes)

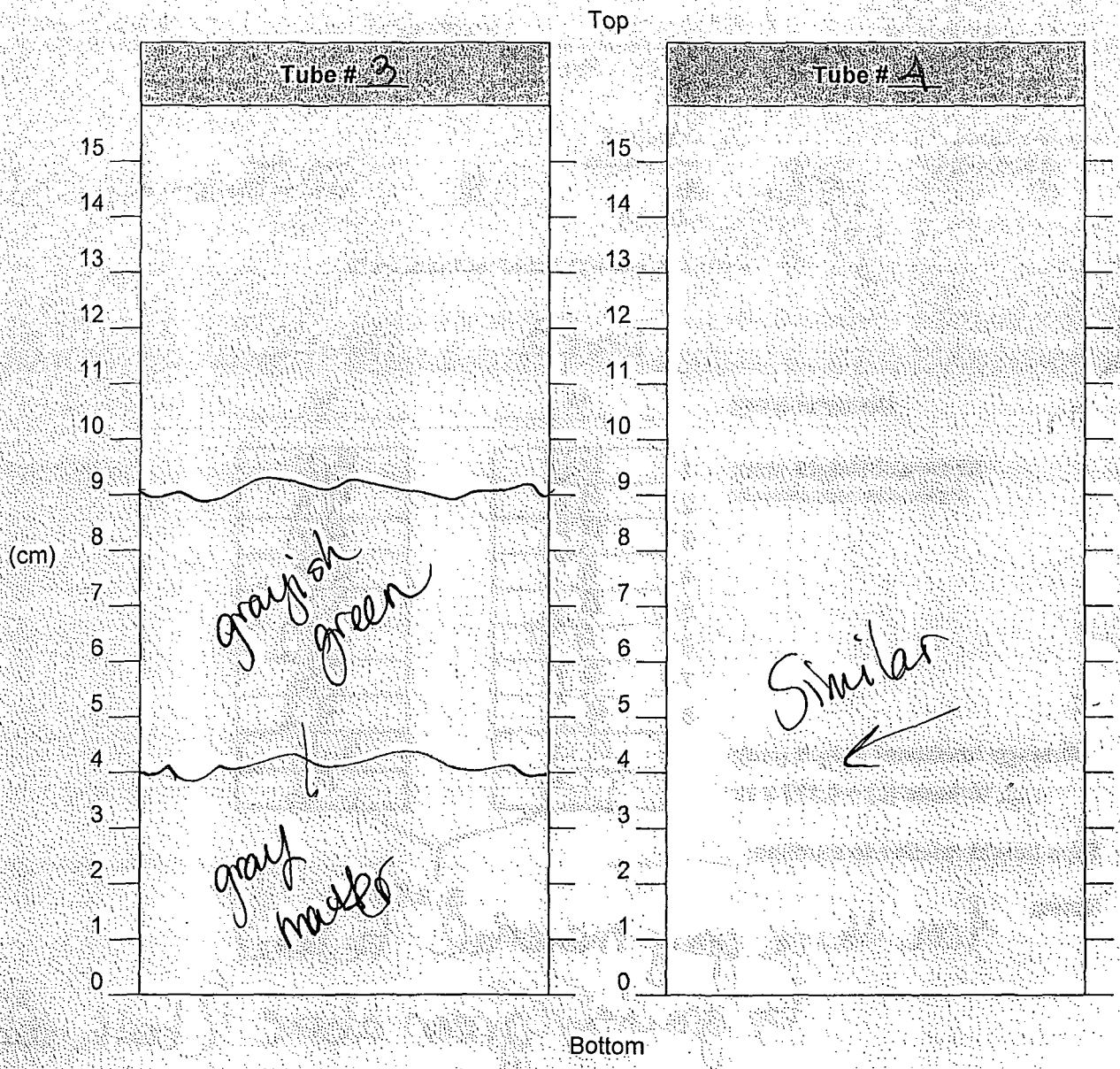
Notes: 4cm thick gray material below
→ grayish green above (both tubes)

Recorded by: DH, LV, JS

Date: 13 NOV 07

Station ID: ST 015

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 11/13/07 Time: 13:55 Deployment Duration (days): 89

Weather: clear calm

Station ID: ST06 Sample ID: LW3-ST4 ST06

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 699027 Long/Easting: 7636489
(Oregon State Plane Feet)

(A) Measured Water Depth (ft): 20 ~~18~~ DSH 11/13/07

(B) Predicted Tide Height (ft) (MLLW): 1.2

(C) Predicted Mudline Elevation (ft) (MLLW): -18.8

(-A+B = C include sign of tide height as reported)

	Tube # 21	Tube # 20
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements)		
1	0.5	1.0
2	0.5	0.9
3	0.8	0.9
4	3.1	2.8
5	3.2	2.9
6	3.2	3.0
7	2.9	2.9
8	2.5	1.5
Average Sediment Height (cm):	2.1	1.99
Volume (L) = 0.177 x H:	0.37	0.35

.72

Tape height relative to mudline: 1

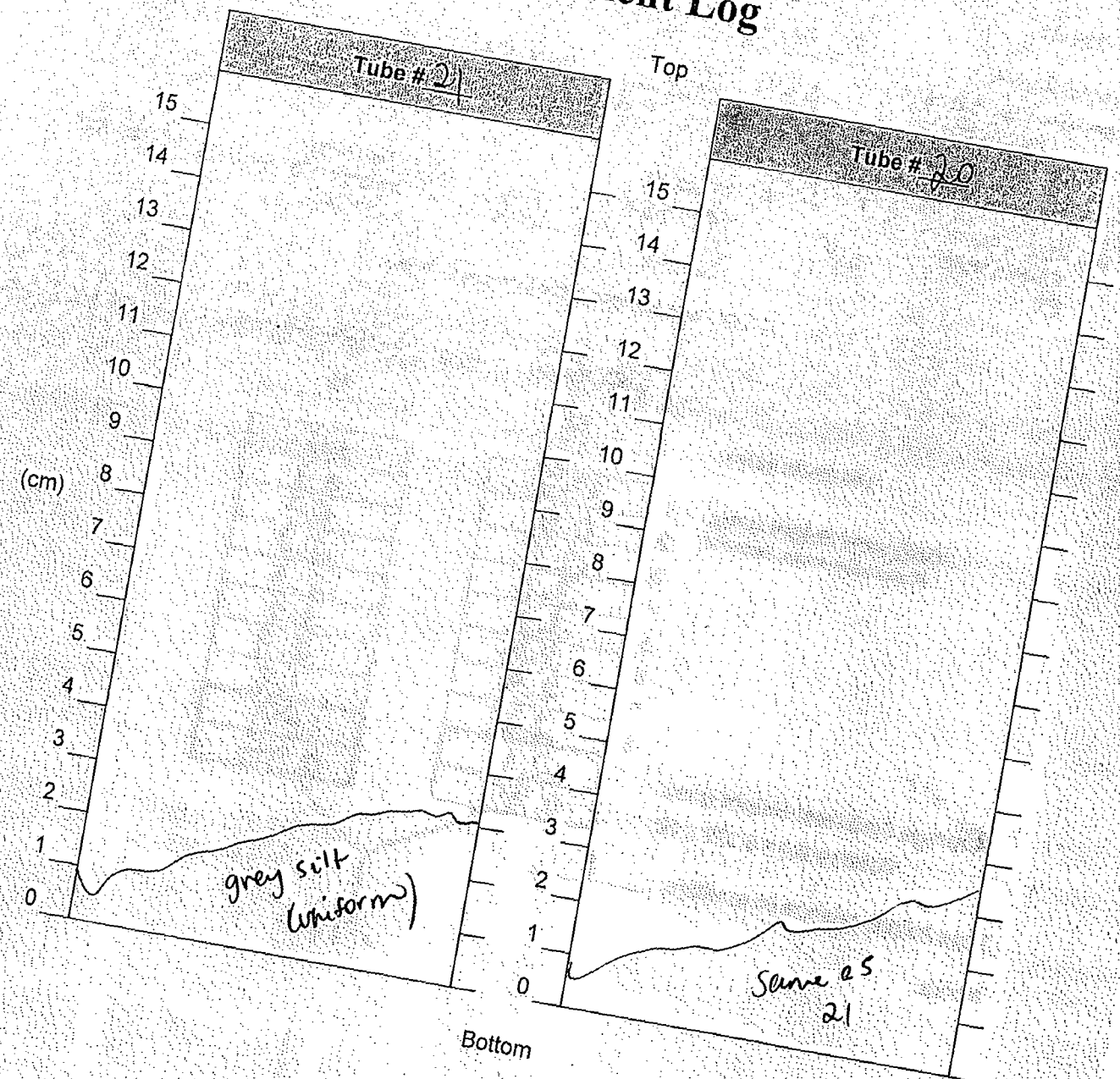
Notes:

Recorded by: DH, LW, JS

Date: 13 Nov 07

Station ID: ST006

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 11/13/07 Time: 14:30 Deployment Duration (days): 89

Weather: clear, calm

Station ID: ST014 Sample ID: LW3-ST4 ST014

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 701232 Long/Easting: 7628746
(Oregon State Plane Feet)

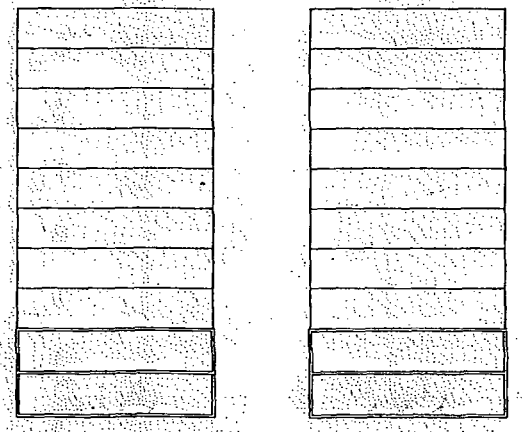
(A) Measured Water Depth (ft) 23

(B) Predicted Tide Height (ft) (MLLW) 1.1

(C) Predicted Mudline Elevation (ft) (MLLW) -21.9

(-A+B = C include sign of tide height as reported)

	Tube # 24	Tube # 25
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements)	See notes below.	
1		
2		
3		
4		
5		
6		
7		
8		
Average Sediment Height (cm):		
Volume (L) = 0.177 x H:		



Tape height relative to mudline: _____

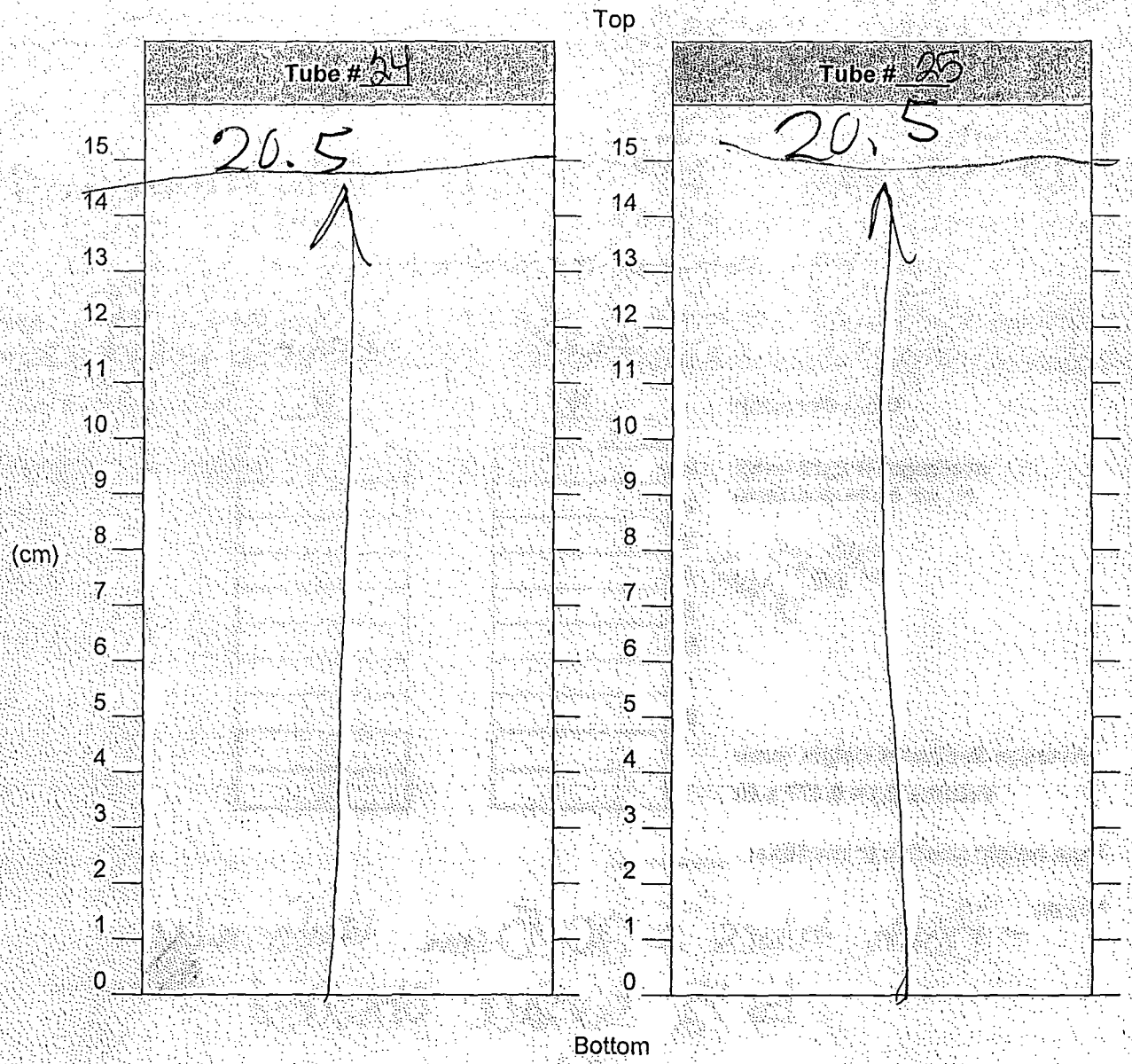
Notes: - Both tubes ≈ 20.5 cm uniformly
↳ ½ surface obscured
- grayish-green silt

Recorded by: DN, LV, JS

Date: 13 Nov 07

Station ID: ST 014

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 11/13/07 Time: 15:10 Deployment Duration (days): 89

Weather: clear, calm

Station ID: LW3-ST13 Sample ID: LW3-ST4 ST013

Project Name: LWG Sediment Traps Project Number: 010142-01

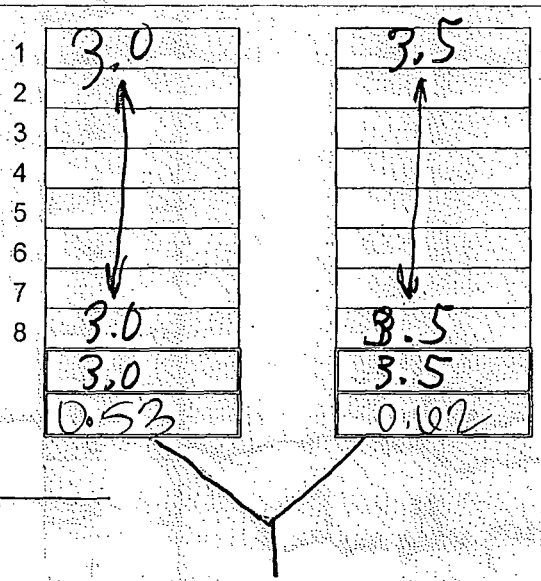
Coordinates (NAD 83): Lat/Northing: 705423 Long/Easting: 7626969

(Oregon State Plane Feet)

(A) Measured Water Depth (ft) 27 (B) Predicted Tide Height (ft) (MLLW) 1.0 (C) Predicted Mudline Elevation (ft) (MLLW) -26.0

(-A+B = C include sign of tide height as reported)

	Tube # 1	Tube # 2
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements)	3.0	3.5
	3.0	3.5
Average Sediment Height (cm):	3.0	3.5
Volume (L) = 0.177 x H:	0.53	0.62



Samples were tilted during recovery. Thickness measurements represent average after allowing sediment to reach stable position

Tape height relative to mudline: 1.15

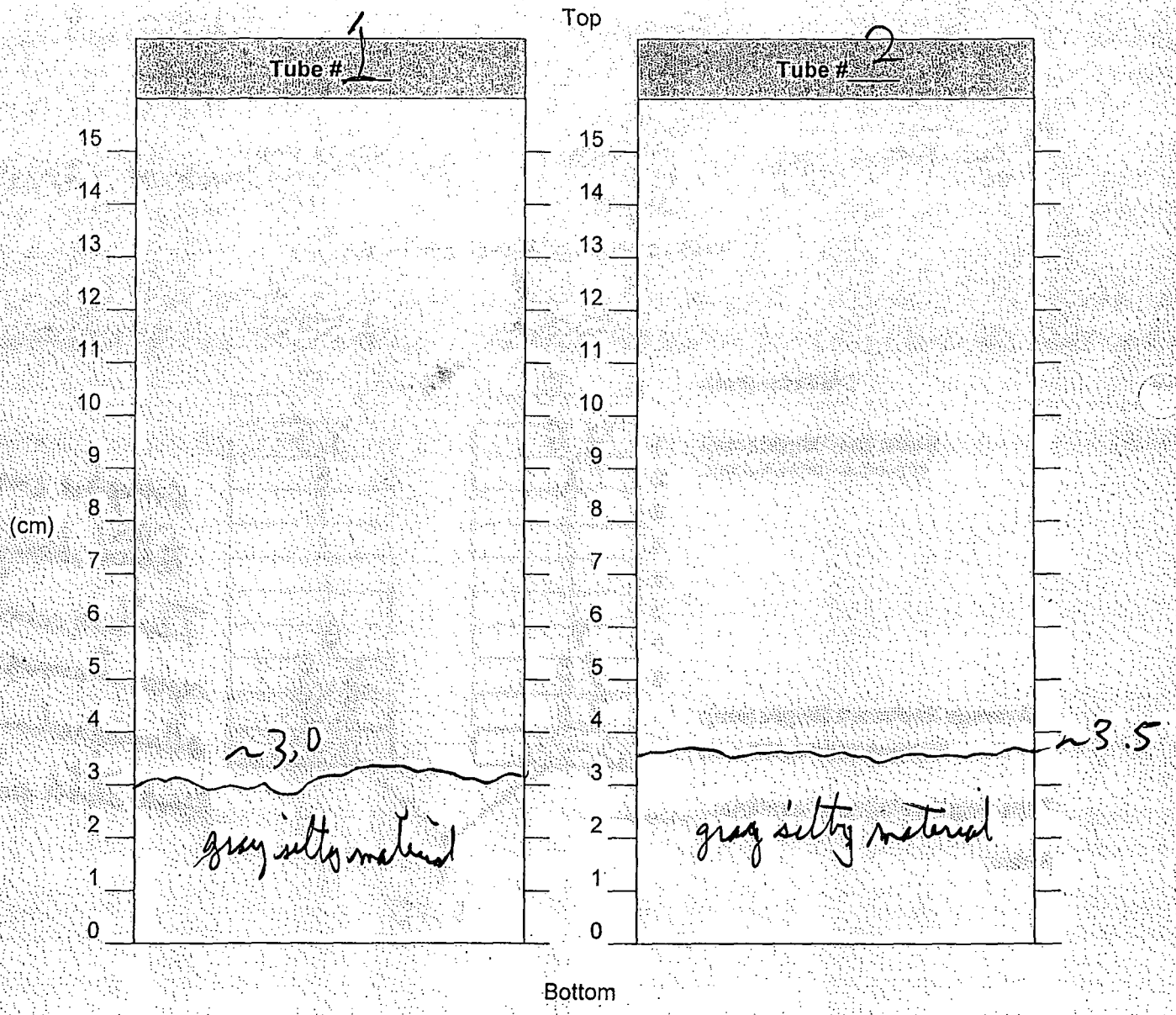
Notes:

Recorded by: D. Hartzell

Date: 13 Nov 07

Station ID: ST 013

Sediment Log



Sediment Trap Collection Form

ANCHOR ENVIRONMENTAL, L.L.C.

Date: 11/13/07 Time: 15:30 Deployment Duration (days): 97

Weather: clear, calm

Station ID: LW3-ST004A Sample ID: LW3-ST4 ST004

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83): Lat/Northing: 707291 Long/Easting: 7623479

(Oregon State Plane Feet)

(A) Measured Water Depth (ft): 30' (B) Predicted Tide Height (ft) (MLLW): 1.0 (C) Predicted Mudline Elevation (ft) (MLLW): -29

(-A+B = C include sign of tide height as reported)

		Tube # 44	Tube # 43
Diameter (cm):		15	15
Sediment Height (cm): (8 perimeter measurements)	1	5.2	6.0
	2	6.2	5.5
	3	5.9	4.2
	4	5.2	4.3
	5	6.0	4.9
	6	7.0	5.0
	7	6.9	7.0
	8	5.9	7.9
Average Sediment Height (cm):		6.0	5.6
Volume (L) = 0.177 x H:		1.07	0.99

Tape height relative to mudline: 1½" below

Notes:

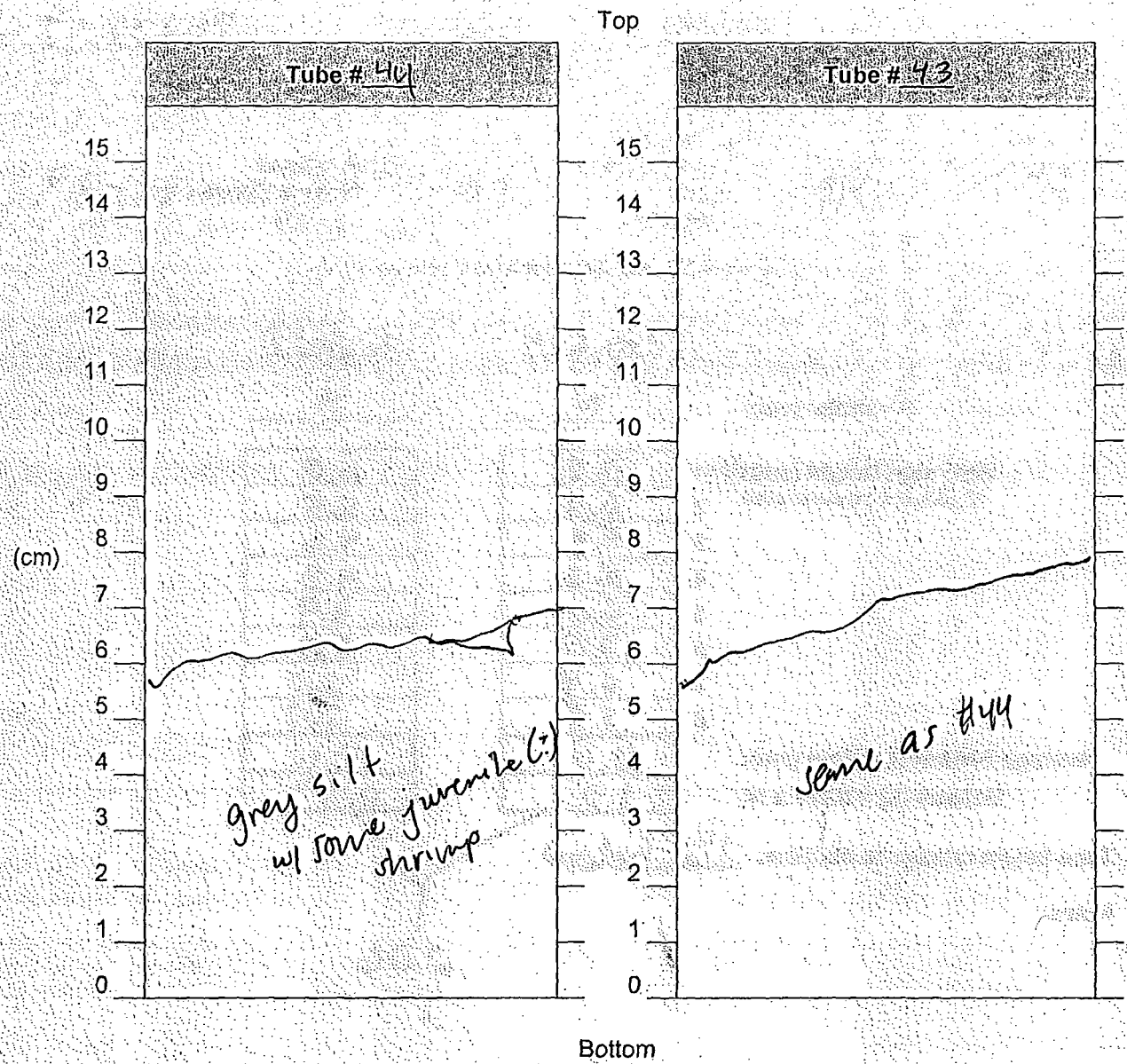
2.06

Recorded by: DN, LV, JS

Date: 11/13/07

Station ID: ST004

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Trap Collection Form

Date: 11/13/07 Time: 16:00 Deployment Duration (days): 97

Weather: clear 50°F calm

Station ID: ST005 Sample ID: LW3-ST4005

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 706509 Long/Easting: 7622786.
(Oregon State Plane Feet)

(A) Measured Water Depth (ft) 28

(B) Predicted Tide Height (ft) (MLLW) 1.0

(C) Predicted Mudline Elevation (ft) (MLLW) -27

(-A+B = C include sign of tide height as reported)

	Tube # 39	Tube # 40
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements) 1	8.6	7.6
2	9.5	8.7
3	9.6	9.0
4	8.9	8.9
5	7.4	6.8
6	7.0 ~~8.5~~	6.8
7	6.5	6.7
8	6.6	7.1
Average Sediment Height (cm):	8.0	7.7
Volume (L) = 0.177 x H:	1.417	1.362

2.78

Tape height relative to mudline:

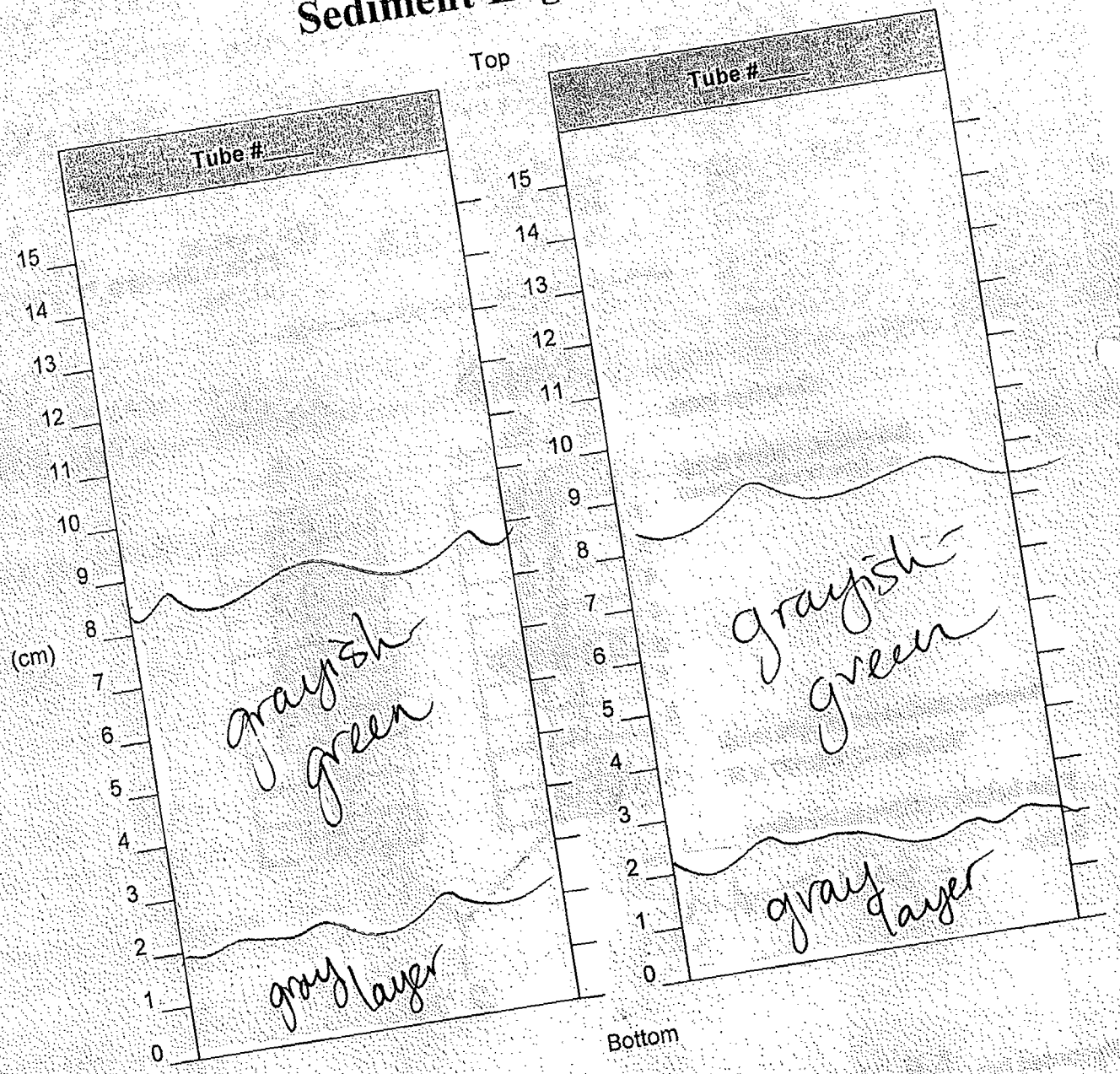
Notes: - some banding

Recorded by: DH, LV, JS

Date: 13 Nov 07

Station ID: ST005

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Trap Collection Form

Date: 11/14/07 Time: 08:25 Deployment Duration (days): 8 10/14/07 890

Weather: cloudy, cold

Station ID: LW3-ST001 Sample ID: LW3-ST4 001

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 725222 Long/Easting: 7617870
(Oregon State Plane Feet)

(A) Measured Water Depth (ft): 19

(B) Predicted Tide Height (ft) (MLLW): 1.5

(C) Predicted Mudline Elevation (ft) (MLLW): -17.5

(-A+B = C include sign of tide height as reported)

		Tube # 22	Tube # 23
Diameter (cm):		15	15
Sediment Height (cm): (8 perimeter measurements)	1	6.6	5.0
	2	6.8	3.9
	3	6.4	3.4
	4	6.4	4.2
	5	6.0	4.8
	6	6.6	6.8
	7	8.5	7.1
	8	7.6	6.4
Average Sediment Height (cm):		6.9	5.2
Volume (L) = 0.177 x H:		1.21	0.92

Tape height relative to mudline: 1" below mudline

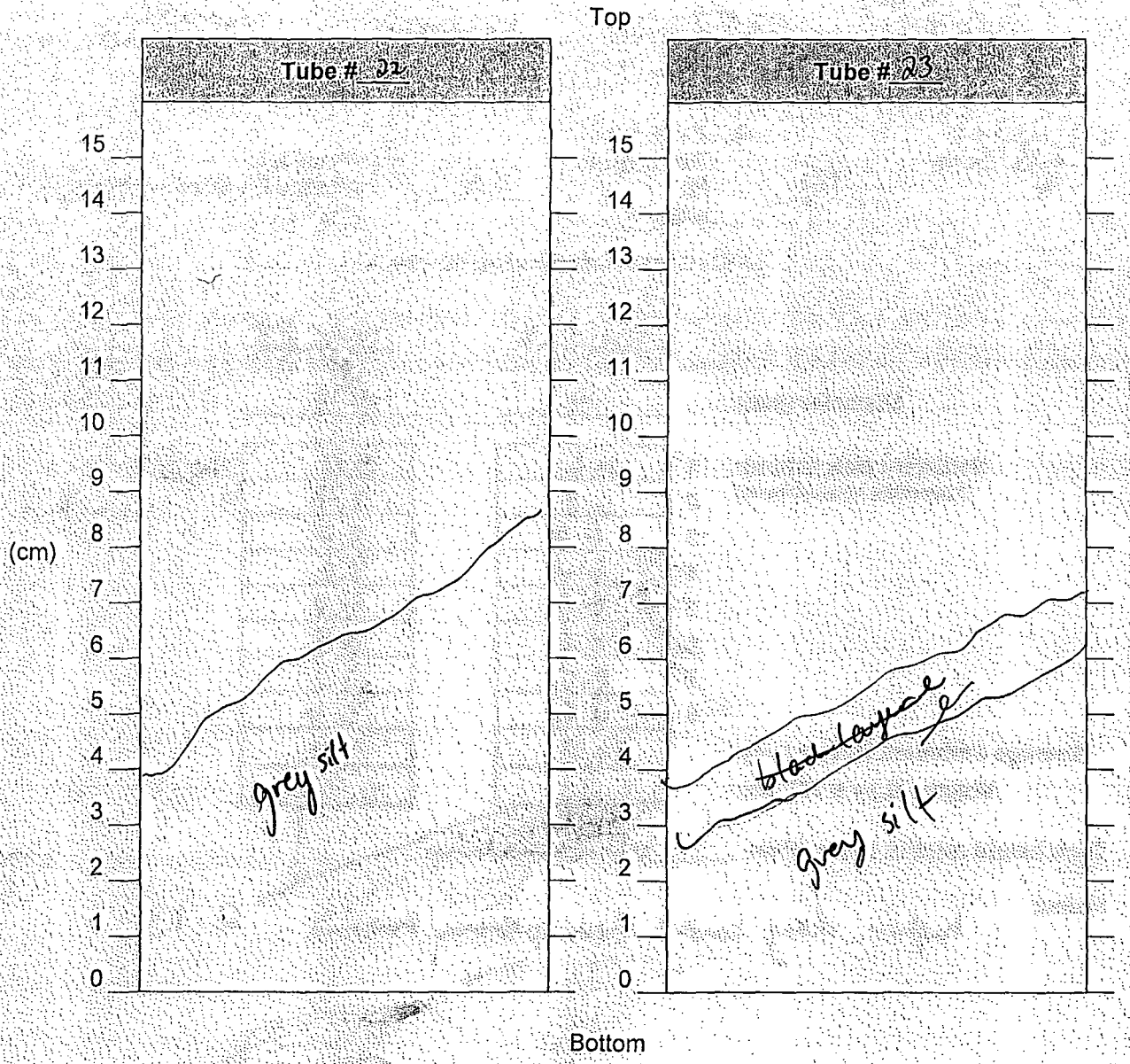
Notes: higher clay content than upstream stations 2.13

Recorded by: DH, LV, JS

Date: 11/14/07

Station ID: ST001

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 11/14/07 Time: 08:55 Deployment Duration (days): 90

Weather: cloudy, cold

Station ID: ST002 Sample ID: LW3-ST4 002

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 726356 Long/Easting: 761862
(Oregon State Plane Feet)

(A) Measured Water Depth (ft): 26' (B) Predicted Tide Height (ft) (MLLW): 1.7 (C) Predicted Mudline Elevation (ft) (MLLW): -24.3

(-A+B = C include sign of tide height as reported)

		Tube # 28	Tube # 29
Diameter (cm):		15	15
Sediment Height (cm): (8 perimeter measurements)	1	6.4	4.9
	2	6.6	5.0
	3	6.4	6.0
	4	6.3	5.8
	5	5.8	5.8
	6	6.2	6.0
	7	6.3	5.4
	8	6.0	5.6
Average Sediment Height (cm):		6.13	5.50
Volume (L) = 0.177 x H:		1.11	0.98

Tape height relative to mudline: 3" below

2.09

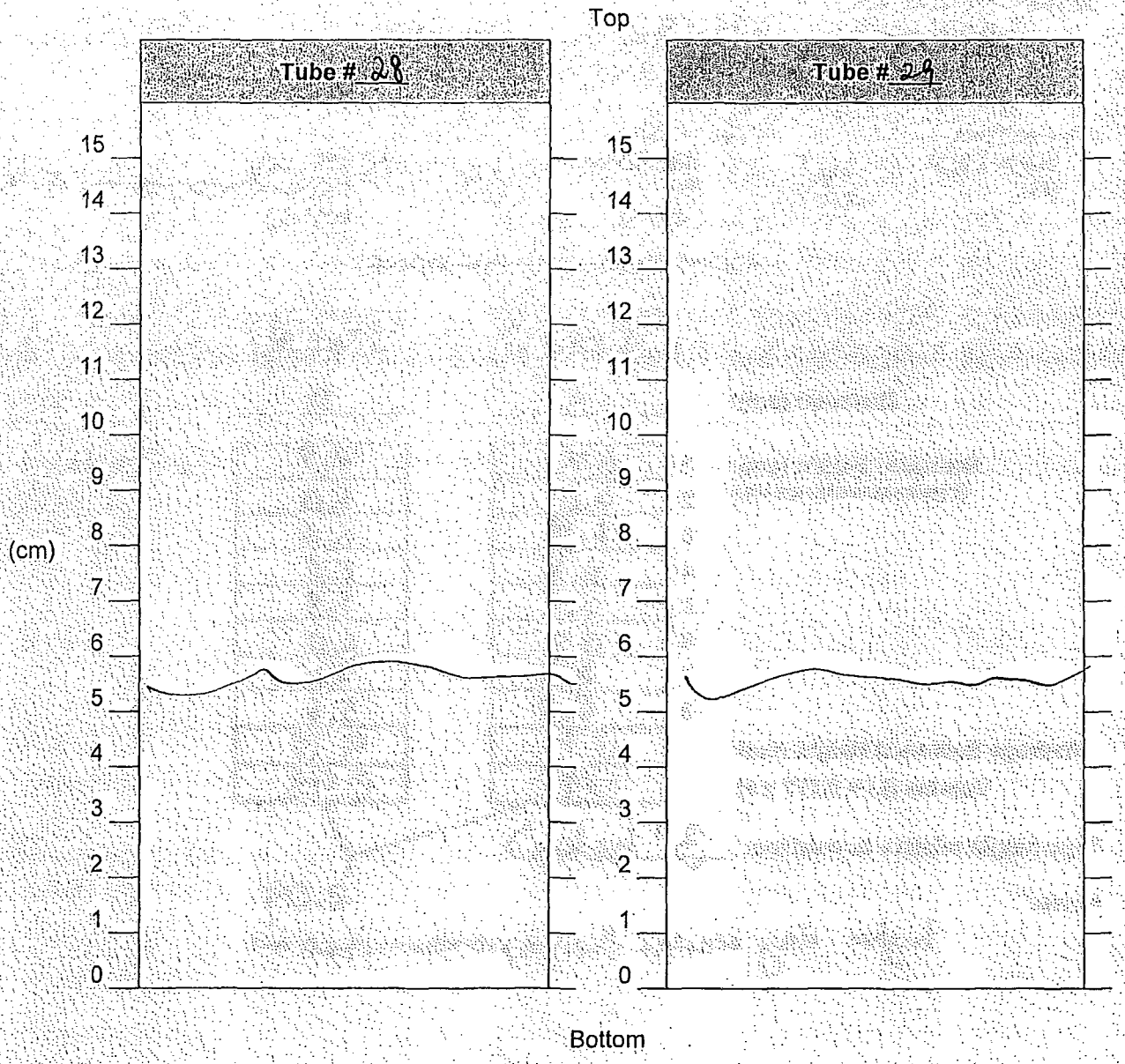
Notes: higher clay content than upstream stations

Recorded by: DN, LV, JS

Date: 11/14/07

Station ID: ST002

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 11/14/07 Time: 09:40 Deployment Duration (days): 90

Weather: cloudy, cold

Station ID: LW3-ST003 Sample ID: LW3-ST4 003

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83): Lat/Northing: 720286 Long/Easting: 7613456

(Oregon State Plane Feet)

(A) Measured Water Depth (ft) 31 (B) Predicted Tide Height (ft) (MLLW) 1.8 (C) Predicted Mudline Elevation (ft) (MLLW) 29.2

(-A+B = C include sign of tide height as reported)

	Tube # 5	Tube # 6
Diameter (cm):	15	15
Sediment Height (cm) (8 perimeter measurements) 1	1.5	0.9
2	0.6	1.2
3	1.4	2.2
4	2.2	1.1
5		
6		
7		
8		
Average Sediment Height (cm):	1.4	1.4
Volume (L) = 0.177 x H:	0.25	0.24

@ quarters

Tape height relative to mudline: 2" below

Notes: small bivalves < 1cm across

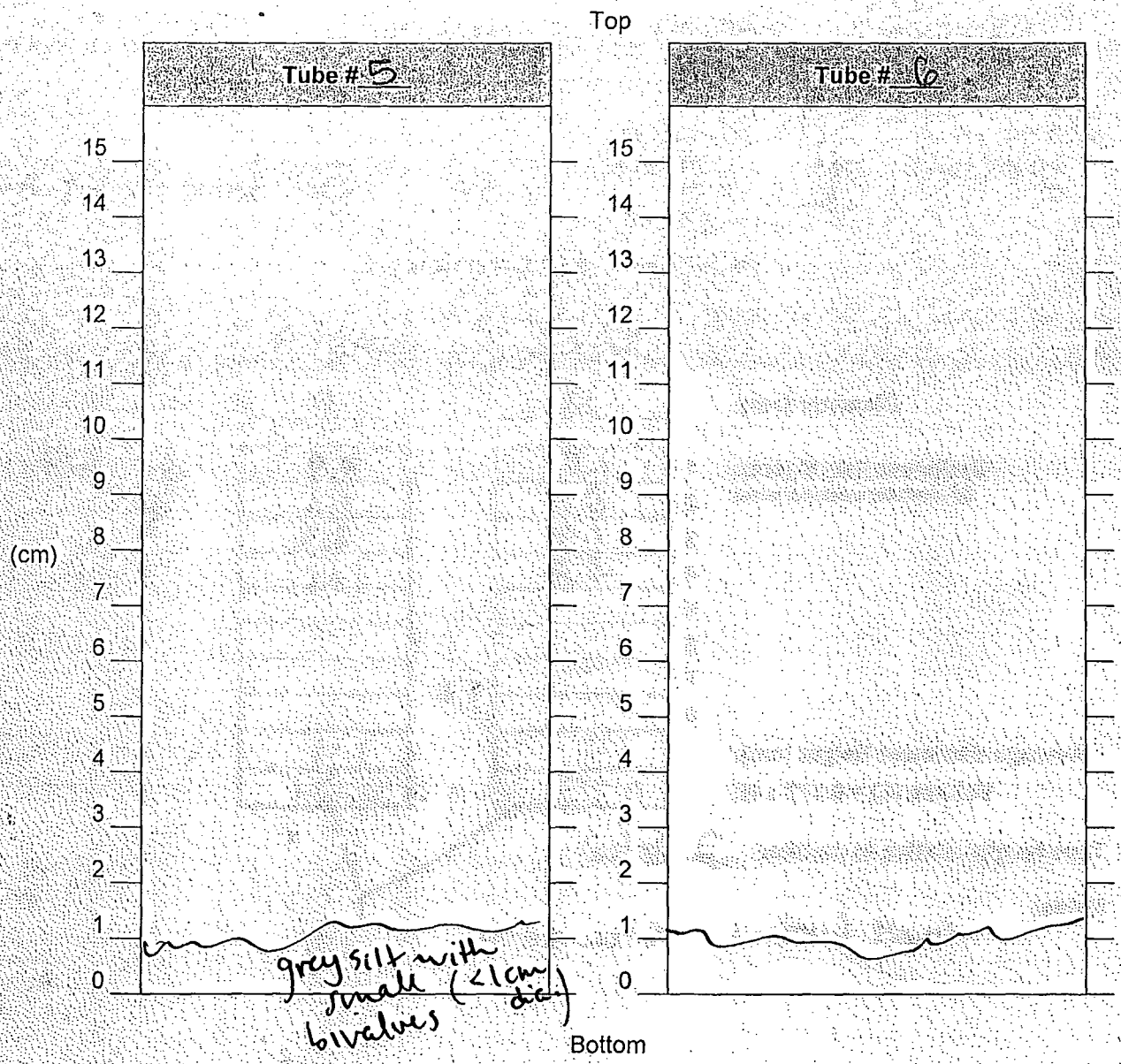
.49

Recorded by: DN, LV, JS

Date: 11/14/07

Station ID: ST003

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Trap Collection Form

Date: 11/14/07 Time: 10:25 Deployment Duration (days): 90

Weather: cold, cloudy

Station ID: LW3-ST01P Sample ID: LW3-ST4 ST01L

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83):
Lat/Northing: 718185 Long/Easting: 7617360
(Oregon State Plane Feet)

(A) Measured Water Depth (ft): 24'

(B) Predicted Tide Height (ft) (MLLW): 1.8

(C) Predicted Mudline Elevation (ft) (MLLW): 22.2

(-A+B = C include sign of tide height as reported)

	Tube # 34	Tube # 35
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements) 1	5.4	5.3
2	5.3	5.6
3	5.4	5.8
4	4.9	5.3
5	5.5	5.8
6	6.4	6.3
7	6.8	6.5
8	6.4	6.3
Average Sediment Height (cm):	5.8	5.9
Volume (L) = 0.177 x H:	1.02	1.04

Tape height relative to mudline: at/even

Notes:

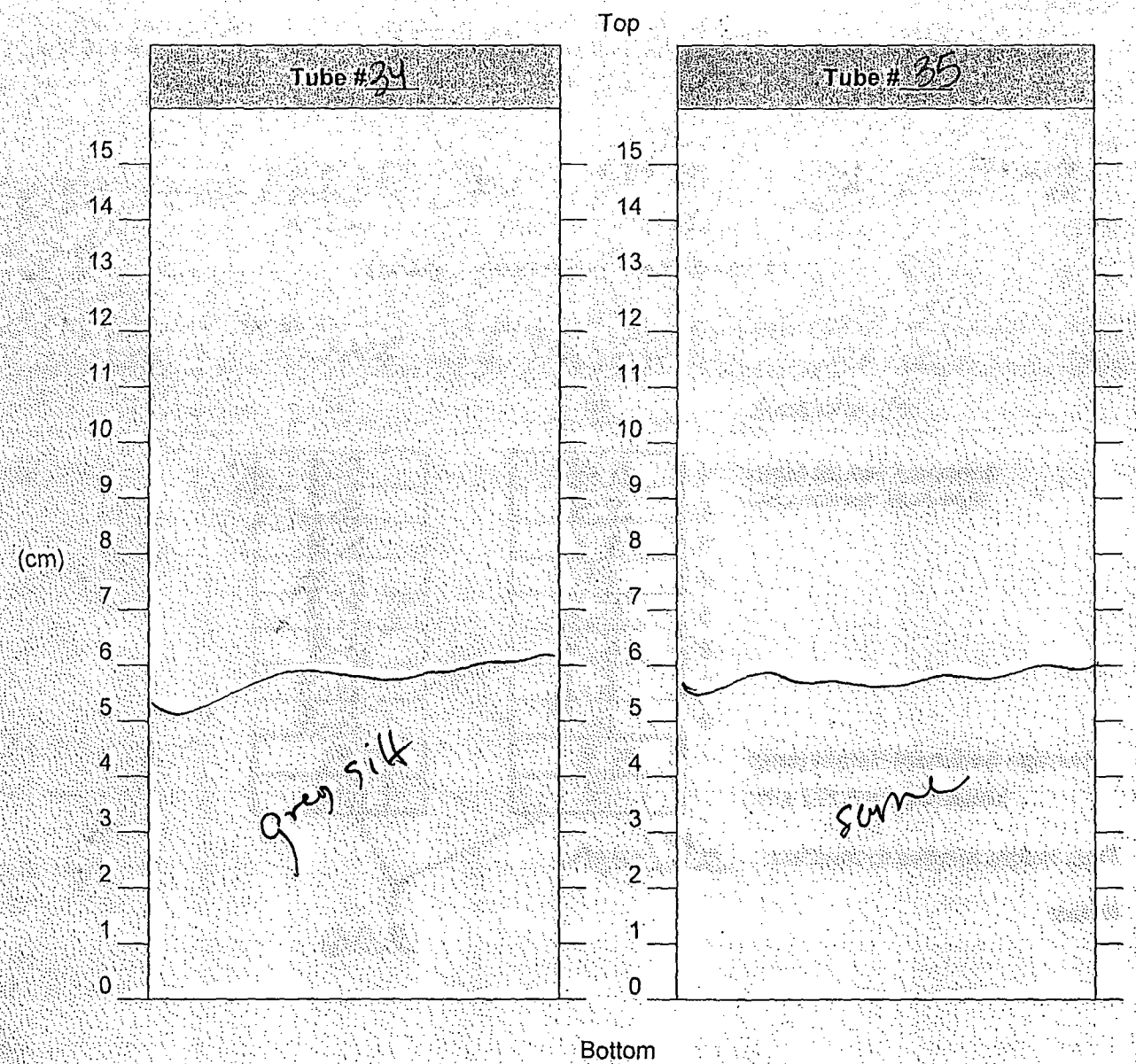
2.06

Recorded by: DA, LV, JS

Date: 11/14/07

Station ID: STQ 11

Sediment Log



ANCHOR ENVIRONMENTAL, L.L.C. Sediment Trap Collection Form

Date: 11/14/07 Time: 11:10 Deployment Duration (days): 90

Weather: cold, cloudy.

Station ID: LW3-ST12 Sample ID: LW3-ST4 012

Project Name: LWG Sediment Traps Project Number: 010142-01

Coordinates (NAD 83): Lat/Northing: 712615 Long/Easting: 7618224

(Oregon State Plane Feet)

(A) Measured Water Depth (ft) 29' (B) Predicted Tide Height (ft) (MLLW) 1.7 (C) Predicted Mudline Elevation (ft) (MLLW) 27.3

(-A+B = C include sign of tide height as reported)

	Tube # 30	Tube # 31
Diameter (cm):	15	15
Sediment Height (cm): (8 perimeter measurements) 1	6.6	6.3
2	6.8	6.2
3	5.8	6.1
4	5.1	6.3
5	4.9	6.5
6	6.8	6.7
7	6.2	6.4
8	5.4	6.3
Average Sediment Height (cm):	6.0	6.4
Volume (L) = 0.177 x H:	1.05	1.12

Tape height relative to mudline: 1" below

Notes:

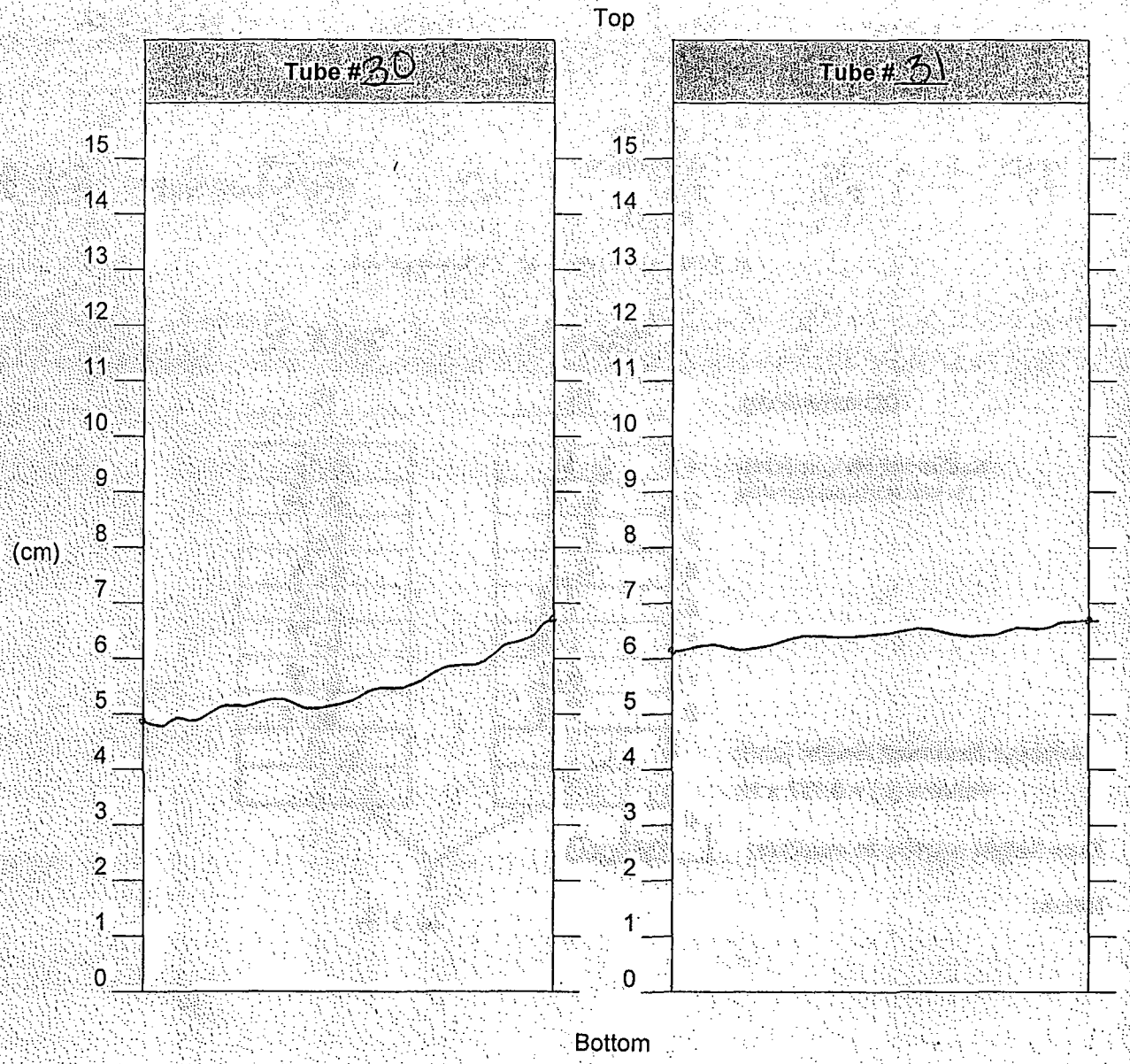
2.17

Recorded by: DH, LV, JS

Date: 11/14/07

Station ID: ST012

Sediment Log



In-water sed traps 17 Aug 07

1205	on station ST007
1213	diver enters water
1230	Diver out of water
1250	leave ST007; en route to ST016
1318	diver is in water at ST016
1335	Insufficient material. Photographed, measured and re-deployed sampler.
1345	Diver out of water.
1355	At ST015.
1410	Diver enters water
1436	Diver aboard. ~~1430~~ gP
1500	Depart ST015 → we collected sediment dupe. at ST015.
1520	at cathedral Park boat ramp.

DJH
17 Aug 07

In-water sed traps 12 Nov 07

0815	- arrive at Integral lab facility. D. Hawblik, Liz Voncky - Anchor Jen Schmitz - Integral pick gear
0910	- at Cathedral Park boat ramp. begin mobilizing onto boat.
1000	windspeeds are increasing; white caps are on the river. The other Integral sed grab sampling crew have decided to leave the water.
1100	windspeeds have increased. D. Hawblik and Eric Parker agree that wind speeds are too high for safe operations on the water. We would have a diver in the water and would be lifting very heavy sampling assemblies over the gunwhal
1130	depart Cathedral Park for lab. We will prepare sample jar packages for sampling locs. We will check weather throughout the afternoon.
1145	at the Integral facility - lunch and began preparing for tomorrow's work
1500	depart Integral facility

LWG in-river sed traps 13 Nov 07

0810 depart Cathedral Park boat ramp
D. Hazelet, Liz Vorchy, Jen Schmitz, Eric Parker, Don Peterson

H&S briefing – slips, trips, falls, fire extinguisher, first aid kit, emergency response

0835 arrive in vicinity of STØ09 and begin prep for sampling
0930 diver in water at STØØ9
0935 diver out of water
~~1000~~ 0945 at STØ1Ø
0955 sampler on board
1015 depart STØ1Ø
1035 arrive STØØ8
1100 depart STØØ8
1110 at STØ16
1200 depart STØ16
~~1230~~ at STØ15
1230 diver in water
12:35 Sample onboard
13:30 Diver in water @ ST006
1355 sample time
1405 depart STØØ6

DUP
STØØ8

LWG sed traps 13 Nov Ø7

14:20 Arrive @ ST014
14:30 Sampler onboard
1450 at STØ13
1500 diver in water
1510 sampler on board
1512 depart STØ13
1520 at STØØ4
1540 leave STØØ4 en route to STØØ5
1550 at STØØ5
1600 sampler on board
1610 depart STØØ5
1615 arrive boat launch.

~~0740~~

[signature]
13 Nov 07

LWG sed traps 11/14/07

0745 leave boat launch
0800 arrive STØØ1
0815 diver in water
0825 diver out of water
08:35 depart station ST001
08:40 arrive @ ST002
08:50 diver in water
08:55 sampler on board
09:05 diver on board
0910 leave STØØ2 en route to STØØ3
0920 at STØØ3
09:35 diver in water
09:40 Sampler on deck
0945 diver on deck
0955 leave STØØ3 en route to ST011
10:05 arrive @ ST011
10:15 diver in water
10:25 sampler on board
10:30 diver on board
10:35 leave STØ11 en route to STØ12
10:45 arrive @ ST012
11:00 Diver in water
11:10 Sampler on board

LWG - sed traps [illegible] Nov 07

11:15 diver on board
1120 leave STØ12 en route to boat launch
1300 at Integral facility – demobe; reinstate blanks; sampler to fridge; store sed traps in narrow alley
1530 depart Integral facility for return to Seattle

LWG
LOWER WILLAMETTE GROUP

Transmittal

To:	Chip Humphrey EPA Operations Office 805 S.W. Broadway, Suite 500 Portland, OR 97205 Eric Blischke EPA Operations Office 805 S.W. Broadway, Suite 500 Portland, OR 97205	**From:**	Dennis Hanzlick, Anchor Environmental
Re:	Portland Harbor RI/FS	**Date:**	January 24, 2008

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